508

No. 508

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IN THE

United States Court of Appeals

FOR THE FOURTH CIRCUIT

Docket No. 7,294

S. H. KRESS & COMPANY,

Defendant-Appellant,

vs.

ELIE P. AGHNIDES and CHASE BRASS & COPPER COMPANY, INC.,

Plaintiffs-Appellees.

APPEAL FROM THE UNITED STATES DISTRICT COURT FOR THE MIDDLE DISTRICT OF NORTH CAROLINA, GREENSBORO DIVISION.

APPENDIX TO PLAINTIFFS-APPELLEES' BRIEF

ALBERT L. ELY, Esq.,
E. R. HAMILTON, Esq.,
ELY, FRYE & HAMILTON,
Akron, Ohio,

R. MORTON ADAMS, Esq.,
THOMAS F. REDDY, JR., Esq.,
PENNIE, EDMONDS, MORTON, BARROWS & TAYLOR,
New York, New York,

THORNTON H. BROOKS, Esq.,
BROOKS, McLENDON, BRIM & HOLDERNESS,
Greensboro, North Carolina,

For Plaintiffs-Appellees.

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R. M. F. WILLIAMS, JR.
CLERK

INDEX TO APPENDIX TO BRIEF

of

PLAINTIFFS-APPELLEES

Testimony at Trial

PAGE

Argument as to Joinder of Party Chase 2

Plaintiffs' Case:

Elie P. Aghnides,
- Direct 6
- Cross 46
- Re-direct 63, 120
- Re-cross 120

J. W. McGarry,
- Direct 122

Norman Lettvin,
- Cross 124

Elie P. Aghnides (Recalled),
- Direct 149
- Cross 175

Depositions

Earl E. Brown (by Defendant),
- Cross 176
- Re-cross 178

Henry A. Theed (by Defendant),
- Cross 179

Denis P. Ganey (by Defendant),
- Re-direct 180

Alfred F. Strang (by Defendant),
- Direct 182

EXHIBITS

PAGE

Plaintiff's Exhibits:

64—Sales Record, Chicago Faucet Co. 183

67—Blue Print of Oxy-Jet 185

71—Invoice of The Chicago Faucet Co. 187

Defendant's Exhibits:

25—Softflo Assembly Drawing 189

30—Softflo Change Order No. 2 191

31—Blueprint of Drawing 1291 193

32—Purchase Data Sheet of The Chicago Faucet Co... 195

(Tr. 3:)

IN THE

District Court of the United States

FOR THE MIDDLE DISTRICT OF NORTH CAROLINA

GREENSBORO DIVISION

Civil Action #857

ELIE P. AGHNIDES, *et al.*,

Plaintiffs,

v.

S. H. KRESS & COMPANY,

Defendant.

Trial of the above-entitled action was begun in the District Court for the Middle District of North Carolina, at Greensboro, North Carolina, before HONORABLE JOHNSON J. HAYES, United States Judge, on Wednesday, January 26, 1955, at 9:30 a. m.

Present:

For the Plaintiffs:

MESSRS. BROOKS, MCLENDON, BRIM & HOLDERNESS, Greensboro, N. C., by Thornton Brooks, Esq.

MESSRS. ELY, FRYE & HAMILTON, 2505 First National Tower, Akron 8, Ohio, by Albert L. Ely, Esq., and E. R. Hamilton, Esq.

For the Defendant:

MESSRS. BLOCK, MEYLAND & LLOYD, Greensboro, N. C., by Norman Block, Esq.

MESSRS. BAIR, FREEMAN & MOLINARE, 135 South LaSalle Street, Chicago 3, Ill., by Will Freeman, Esq., and D. D. Allegretti, Esq.

* * *

(Tr. 12:)

Mr. Freeman: Under those conditions, we want to now make a motion before this Court that the second count of the complaint, which is directed to injunctive relief as distinguished from money damages, be dismissed.

(Tr. 13:)

The authorities are with us on that. There is no basis for this Court granting any injunctive relief to Mr. Aghnides because he has nothing that he can now protect.

* * *

Mr. Freeman: If they want to move to bring in Chase, that's another story, but nothing has been done.

* * *

(Tr. 16:)

Mr. Freeman: There is no question but what this suit may go on, in so far as damages, but we are talking about the injunctive relief.

The Court: It's no longer the policy of the federal courts to try any case by piecemeal, and we are interested, if we have to devote time to the trial of a case, to try it in a way to determine the rights of the parties. You just can't take them up piecemeal.

Mr. Block: That is our position, your Honor.

The Court: Subparagraph (a) of Rule 17 says:

> "Every action shall be prosecuted in the name of the real party in interest."

I am omitting the other part, not germaine to this.

Mr. Ely: I was going to say that although that assignment bears date December 3, 1953, it was not delivered and the actual delivery and consummation of the sale was not until December 8, 1954. So at the time the suit was filed Mr. Aghnides was in full possession of the patent.

The Court: I understand that. There's no doubt about his right to maintain it up to that point, but, so far as now appears, after he sold his patent, he has no future interest or right to it, if it's sold. I don't have the document (Tr. 17:)
before me, but, if that is the case, his successor in title alone is the one who would be interested with respect to any future infringement, and I can readily see why, in the event that the Court should find the patent is valid and the defendant is infringing, I can readily see why there would be no equitable ground for the granting of an injunction against the defendant in favor of this plaintiff, because at this time the plaintiff has no interest in the future conduct of the defendant. On the other hand, the successor in title is interested vitally in the future, and, if it isn't interested to the extent that it wants to enjoin the defendant, then it ought to have the action dismissed, or, rather, it should be dismissed, it would seem to me, as to Aghnides so far as injunctive relief is concerned, and narrow it down to the question of damages up to the present.

On the other hand, it appears to me preferable for the other party to come in and prosecute this action to a finality. In other words, if it is no longer interested in enjoining the defendant, if the present owner is not, the there's no use of our wasting time about the injunction, but, if it is interested, now is the best time for it to come in and show what its interest is. You might not be in a position to speak for the present owner—I don't know—

(Tr. 18:)
but for my part, looking at it solely from the standpoint of the Court's time, which is fully occupied, I don't want to waste time trying something that's not necessary, that's moot.

If you want time to confer and if you want to contact the present owner or its counsel to see if they want to come in here now and assert their rights under this assignment, I will be glad to entertain a motion to that effect, and, if necessary, continue the case, if it's going to take anybody by surprise. I have postponed everything else now with the expectation of trying this case this week.

Mr. Brooks: May I make the observation, may it please the Court, that even under the contention of Mr. Freeman this case can and has to go on at some time with regard to the matter of damages that Mr. Aghnides would be entitled to. That, in turn, involves the consideration of validity and non-infringement. So whether or not the equitable relief of an injunction to implement a decree is granted, it would still depend on the basic finding of validity of the patent and non-infringement.

The Court: But I don't think, Mr. Brooks, that the present owner should stand aloof from this litigation and then come in under this patent and harvest, if he can, what relief might be obtained in Aghnides' name now, unless it is willing to share in the burden. If it wants injunctive
(Tr. 19:)
relief it must come in here and assert it.

If you gentlemen want to confer and contact these people, I will give you time to do it; will postpone this trial until two o'clock if necessary. I want to know what you want to do.

Mr. Ely: I don't think it will take us until two o'clock. We will have to reach the patent attorneys for Chase Brass Company in New York. I think we can reach them in a very short time and get an answer.

The Court: Let me ask you gentlemen this: If that assignee authorizes this counsel here to enter the assignee as a party plaintiff—of course it doesn't dismiss the case as to Aghnides; he still has rights in this court—if they authorize counsel here to enter their appearance and to adopt the pleadings of the plaintiff and also to file the assignment, showing their title, and let the case proceed, would you gentlemen consent to go along with the trial or do you want time?

Mr. Freeman: We will consent to go along with the trial, provided Mr. Quay, who is General Counsel and Secretary and who carried on all the negotiations with Mr. Aghnides, presents himself to the Court for the purpose of my cross-examining that individual adversely, and if they will bring all of their records with respect to their (Tr. 20:)

sales of these devices which were made under the former license granted by Aghnides—in other words, I want to go ahead, your Honor—

The Court: Well, I won't impose all of those conditions.

Mr. Freeman: Then we need time, obviously.

The Court: If it comes in here, I will let it come in as assignee of this man, and the only thing that would be involved then is whether it is now the owner under the assignment of the patent Aghnides was prosecuting for the protection of. This case here in no wise involves any right on their part to recover for any infringement of Aghnides' patent while he was the owner, so I don't see why I should require them, as a condition, before they could come in, to bring their General Counsel here and also to file a report as to how many of these things were sold by them. As I understand, the present owner was a licensee of Aghnides before.

• • •

(Tr. 21:)

The Court: What do you want to do, Mr. Ely?

Mr. Ely: I'd like to call the Chase Brass attorneys in New York and ask them whether they want to enter their appearance here as a party.

The Court: You can also tell them that if they don't do it this Court intimates it will dismiss this plaintiff's plea for injunctive relief on the ground he has no interest in the patent at this time.

* * *

(Tr. 23:)

(By Mr. Ely:) In other words, I move now to amend the complaint by the addition of Chase Brass and Copper Company, Inc., of Waterbury, Connecticut, a Connecticut corporation, as party plaintiff, and it adopts the complaint

(Tr. 24:)

and the pleadings so far filed on behalf of Mr. Aghnides.

* * *

(Tr. 31:)

Mr. Freeman: I have no objection to the Chase people entering their appearance here and being bound by this Court's action, except that I want some time to prepare as against Chase.

* * * *

(Tr. 39:)

ELIE P. AGHNIDES, the plaintiff, being first duly sworn, testified as follows:

Direct Examination by Mr. Ely:

* * *

(Tr. 42:)

Q. (By Mr. Ely:) Mr. Aghnides, where were you when the invention of Patent No. 2,210,846 was made?

A. I was in Belgium; in other words, when I made that application, the corresponding application, I was in Belgium.

(Tr. 43:)

Then I applied for a patent in Belgium sometime early in December, I think, in 1934.

Belgium sometime early in December, I think, in 1934.

Q. Do you recognize a file history, which is Plaintiff's Exhibit No. 15, the file history of the abandoned application 52,923?

A. Yes, I do.

Q. Where was the original text of that application prepared?

A. In Belgium, by Belgian patent attorneys. They prepared the text, the specifications in there, in English and sent it down to Washington.

Q. Are you also familiar with the application for the first patent in suit, the file history of which is marked Plaintiff's Exhibit 16?

A. Yes, I am.

Q. What was the reason for preparing the second application, the second application which finally resulted in Patent No. 2,210,846?

A. When I paid my first visit to this country in 1937 one of the attorneys who went through this application of mine in the Patent Office—

• • •

(Tr. 44:)

Q. You mean the application which was then in the Patent Office?

A. Pending, the pending application. He thought that the English wasn't too clear and not too much in keeping with American practice and he thought it would be a good thing to rewrite that application.

Q. Was that the reason why the second application, the one you have in your hand, the application for the first patent in suit, the reason why that was rewritten and refiled?

A. That's right.

• • •

Q. (By Mr. Ely:) When did you next come back to this country?

A. In the fall of 1939.

Q. Why did you come back to this country in the fall of 1939?

A. Because my patent attorney in Washington advised me that we had difficulty with the Patent Office, we could not get the claims we thought we were entitled to and might have to have some litigation and go to the Board of Appeals in the Patent Office. I decided to go to Washington and give a demonstration in the Patent Office to show the difference from the prior art.

(Tr 45:)

Q. At that time the application was still in the hands of the Examiner, was it not?

A. Of course.

Q. Do you remember the patent on which your application had been rejected?

A. The Felten vacuum pump.

Q. Is that the British patent I show you, Felten British patent 6012 of 1909?

A. Yes, it is.

(Tr. 47:)

A. (By Mr. Aghnides:) The Patent Examiner, my patent attorney and myself went to the wash-room, and I connected each device on the faucet to give a demonstration. I have shown what each device does, what each device performs. You could see the Felten pump giving a meager stream with very little air in it, and then I

(Tr. 48:)
projected that stream from Felten into a soap solution and it gave a little amount of lather. Then I put my own aerator on the faucet and the Examiner could see the difference of the stream. If I am allowed, the stream business is something that you have really to touch and feel it; it's not something you can just sit and read over and say which is which. So the Examiner handled those streams, saw the effects of those streams on soap solutions, and withdrew the reference he had cited against my application.

• • •

Q. Did you take any part in the appeals proceedings?

A. I certainly did.

Q. What did you do?

A. I had the cited devices of Haisman and Friedrich built for demonstration purposes and also had my own aerators and I gave a demonstration to the three chief examiners of the device of Haisman, the device of Friedrich, and of my water aerators, particularly the one I just described, the Belgian-made aerator, and I also had with me an aerator made out of rubber with metal parts inside and I gave a demonstration with each.

(Tr. 56:)

Q. Do you have the rubber aerator which you demonstrated before the Board of Appeals?

A. Yes, here it is.

• • •

(Tr. 57:)

Q. (By Mr. Ely:) Did the three examiners go with you into the washroom?

A. Oh, yes, they went with me, and they came and touched the stream and appreciated the difference.

Mr. Freeman: We object to that.

The Court: Strike out that part of it.

The Witness: They came close to the demonstration and examined what I was showing to them.

Q. (By Mr. Ely:) Did they feel the stream, put their hands in it?

A. They did.

Q. This was in 1939, I believe, when this was done?

A. Yes, I suppose it was late in 1940; (Tr. 58:)
I wouldn't remember. The record shows the date.

* * *

Q. (By Mr. Ely:) Do you have a copy of Patent No. 2,210,846?

A. Yes, I have it here.

Q. I wish you would take that, please, Mr. Aghnides, and with special reference to Figure 4 and without going into any other figures right now, will you please describe the principles of construction and the principles on which that aerator works?

A. Figure 4 in the Patent 2,210,846, typical of my aerating principle, shows a casing, number 32. In the downstream end, inside that casing, there are two screens.

Q. Give the numbers, please.

A. They are numbers 40 and 42. Upstream of those two screens there are air ports or openings, 38, and upstream of those air ports or openings, 38, is diaphragm 36. This is the construction.

Q. Tell me about the diaphragm.

A. The diaphragm has a certain number of holes, it might be one or more. These orifices are small in order to oblige the water from the faucet to enter the chamber between the diaphragm and the screens I mentioned be- (Tr. 59:)
fore with great velocity, substantial velocity, so that in

that open chamber, the chamber open to the atmosphere through the orifices 38, the streamlets are naked, surrounded by free air, air circulating freely between those streamlets, so that when those streamlets find in their path resistance—in this case the resistance is presented by the screens 40 and 42—those streamlets break up and trap the surrounding air in the form of bubbles and then they discharge that from the lower end, the downstream end of the device, in the form of foam.

Q. What does the patent show about the screens, about the number of screens?

A. Well, the patent says that the highly efficient form of—you see on page 1, at the bottom of the column on the left, it says: "Also I find that a highly efficient form of dividing means is a fine screen located at the outlet, and I have found that even better results can be obtained if two or more superposed screens are used in the outlet discharge." Then it says: "The size of the mesh employed is not critical but I have obtained good results where the holes in the screen measured about .6 square millimeter."

Q. Now is there anything in the patent about any relationship between the resistance offered by the screens and the stream velocity?

(Tr. 60:)

A. There is indeed complete explanation of the relation between the orifices in the diaphragm or the velocity of the streamlets and the resistance to be placed below.

Q. Will you please point out where that is?

A. Yes, at the end of page 1, column 1, right, it says, last line: "While the total cross sectional area of the perforations in the screen 16"—meaning diaphragm 16—"under the usual conditions of operation, is such as to force the water into the chamber with substantial velocity and the screen 20"—meaning the wire mesh screen below

—"has the proper relative resistance thereto, to effect the desired result, it is obvious that any change in the cross sectional area of the perforations in the screen 16"—which is the diaphragm—"will require a change in the resistance of the screen"—

Q. That is the lower screen?

A. That is the lower screen. (Continuing) "—to establish the proportion necessary for the maintenance of substantially the same result. This water, again contacting with the screen 20, will pass through the screen with the air and emerge from the outlet 22."

Q. What type of stream do you get, what type of stream issues from the aerator? Please call attention to that.

A. Yes, I gave a description in my patent, page 2, left (Tr. 61:)
column, second paragraph, which explains about the functioning of this device.

• • •

(Tr. 62:)

Q. (By Mr. Ely:) Mr. Aghnides, just before the noon recess you were talking about the thoroughness of aeration. You were referring to that part of your patent on page 2, column 1, line 35. Did you complete what you wanted to say about the thoroughness of aeration?

A. Yes, aeration of the water is not effective unless every particle of water comes in touch with air. Now the aeration in industry is very well known. Hundreds of cities aerate the water; they spray it up in the air so that every particle will be aerated. So it is very important for my domestic aerator, so that the wife would have aerated water at the point of use, that the water is really aerated, because otherwise it's like mixing a glass of aerated water with five or six glasses of non-aerated water, and you can not say that the seven glasses of water formed by the mixture is aerated water. So it

is extremely important that the stream should be packed, aerated, with water, so that the air passes every particle (Tr. 63:)
of water. Even though the industrial aeration existed for decades, even though the water pumps were in the hands of scientists for decades, the water pumps were never used as aerators because they bring only a fraction of the water delivered in contact with air, and the result is not aerated water.

Q. You said something about the aerating at the point of use. Is that what your aerator does?

A. Yes, because in the case of industrial aerators, where the city aerates water, before delivery, that water, in spite of the aeration at the source, when that water traverses the canalization miles and miles before it reaches the housewife, it has lost already a great deal of the benefits of aeration and, as a result, water from the faucet is flat in taste, whereas my aerator for the first time gives a stream of water fully aerated at the point of use.

Q. I want to ask you this question: What character of stream do you get from your aerator?

A. I produce a stream which is coherent, packed with bubbles, so that all of the water comes in touch with air, a coherent, soft stream.

Q. Is there a reference to the coherent character of the stream in your patent?

A. Yes, sir, there is.
(Tr. 64:)

Q. Point it out, please.

A. I think it's on page 1, the left column.

Q. I can point it out for you: beginning about line 25, and then down further about line 45.

Q. What is the relation of the air inlet, air ports, with respect to the diaphragm, looking at Figure 4, for instance, and some of the others.

A. In the principle of my water aerator, the air inlets, for instance, in Figure 4 of the patent, as shown by numeral 38, open directly in the chamber directly downstream of the perforated diaphragm 36, so that the chamber will be at all times filled with air in which naked streams will be running through.

(Tr. 65:)

Q. Do the streamlets, or the jets, under high velocity, enter the chamber through the same ports as the air enters the chamber?

A. No. I have orifices in the diaphragm 36 for the delivery of water in the mixing chamber, and then I have independent orifices shown by numeral 38 for the entrance, admission, of air through those apertures into the mixing chamber. They are very separate and distinct orifices.

Q. Do you have a sample here that is made up in accordance with Figure 4?

A. I do.

(Tr. 67:)

The Witness: Now I proceed with the description of this device. Dowstream of the orifices which admit air during the operation we have two screens, as shown by numerals 40 and 42 of Figure 4 of my patent. Then downstream of those screens we have the outlet end through which emerges the coherent stream full of bubbles. This is, in substance, Figure 4.

(Tr. 68:)

Q. (By Mr. Ely:) Is that the Spring-Flo aerator made by Chase Brass?

A. Here I am holding the aerator made by Chase Brass and Copper Company under the trade name "Spring-Flo."

Q. Will you please take that apart and show his Honor

the internal construction and correlate it with Figure 4, match it up with Figure 4?

A. Yes, sir. These are the parts I am taking out of the main body or casing which, in Figure 4, are shown by 32. In the casing, the downstream end of the casing, as in Figure 4, there is a plurality of screens. Figure 4 shows two screens. The patent says two or more screens. I have three screens in the Spring-Flo aerator. Then in the downstream connection of those screens I have a perforated diaphragm. The perforated diaphragm has a skirt for creating the space between the diaphragm and the screens.

The Court: The skirt does the same thing as the wall was said there to do?

The Witness: Yes, the skirt has orifices for the admission of air and those orifices on the skirt are (Tr. 69:)

matching the orifices on the side of the casing so that the air enters through the slots on the casing and through the orifices on the skirt of the lower part of the diaphragm and reaches the mixing chamber, as the case is as shown in Figure 4 of the patent. Now the Spring-Flo aerator incorporates also my improvement patent. At the upstream end of this device I described and which forms a complete aerator, according to my first patent, at the upstream end I put a second diaphragm, which is the object of my second patent, and this is a complete Spring-Flo aerator as sold by Chase Brass and Copper Company.

The Court: This perforated diaphragm which takes the place of 34?

The Witness: Yes, on top.

Mr. Ely: No, not 34.

The Witness: 36.

The Court: 34 is what you call the skirt or shoulder?

The Witness: To support the diaphragm?

The Court: That spaces it up above these perforated screens?

The Witness: Yes, sir.

The Court: That particular device isn't described in Figure 4, is it?

(Tr. 70:)

The Witness: No, the skirt is not shown, but it is a shoulder to receive the disc in diaphragm 36. In the Chicago Faucet aerator we don't have that skirt and instead we have a shoulder so that the diaphragm could be placed on the shoulder, as shown in Figure 4. It has no functional importance.

The Court: Is there any functional difference between the device that is used here in the Chase aerator and that described in Figure 4?

The Witness: Not in principle; there is no difference in principle at all. In other words, if on this aerator or Spring-Flo that I am holding I put shoulders to space my diaphragm, the result would be exactly the same stream, and, as I said, the example is the Chicago Faucet aerator where, instead of a skirt, we have a shoulder for creating the space between the screens and the diaphragm.

Q. (By Mr. Ely:) Does that aerator bear both your patent numbers?

A. Yes, they do, the patent numbers, both of them.

Q. You were just talking about the Chicago Faucet. Let's have one of those.

Mr. Ely: This will be Plaintiff's Exhibit 30.

(The model aerator referred to was received in evidence as Plaintiff's Exhibit 30.)

(Tr. 71:)

The Court: That's a sample of what?

Mr. Ely: Chicago Faucet Company's Softflo aerator.

The Court: Is that one of the licensees of his?

Mr. Ely: Yes, sir.

The Witness: I am holding now the aerator made by the Chicago Faucet Company and sold under the name "Softflo." Now this aerator, Figure 4 of the patent and Softflo are exactly the same in this respect: that in the lower end we have the screens, as in Figure 4; then above the screens, upstreamwise, we have orifices for the admission of air in the space above the screens and as in Figure 4 where we have the orifices 38 just above the screens. Then above those orifices we have a shoulder to receive the diaphragm 36 of Figure 4, and as you may see, your Honor, there is no skirt; the diaphragm rests directly on those shoulders. So that skirt, in the Spring-Flo aerator, has no function except to keep apart the screens from the diaphragm, and in this construction that skirt does not exist. Then above the diaphragm we have a washer for spacing purposes and for sealing; and then I have a second diaphragm above the first diaphragm, and this second diaphragm is the object of my second patent. Above that I have a washer so that when this aerator is screwed onto the faucet water will not leak through.

(Tr. 72:)

Q. And that is also marked under both your patents, is it, both patents in suit?

A. It is, yes.

Q. Is there a commercial aerator made under your patent like Figure 1?

A. Yes.

Q. What is that, what name; whose is it?

A. This is an aerator made by Firestone Tire and Rubber Company under both my patents.

Q. What is the name of it?

A. The name of it is Velva-Flo aerator.

(Tr. 74:)

Q. (By Mr. Ely:) I wish you would look at Figure 6 and please explain to his Honor the construction of that form of your device, the one shown in Figure 6.

A. Figure 6—

Q. Incidentally, do you have an aerator that is made in accordance with Figure 6?

A. I do.

(Tr. 75:)

Mr. Ely: Let's have that. I am going to ask that this be received as Exhibit 32.

(The model aerator referred to was received in evidence as Plaintiff's Exhibit 32.)

Q. Will you first describe what the construction of Figure 6 is and then take that sample apart and show the Court just what you have?

A. Figure 6 of the patent shows, as in the other figures, the diaphragm. In Figure 6 the diaphragm bears the number 56. Then immediately below the diaphragm we have air vents, which are not marked by any number, so that air will be admitted in the chamber during the operation of the device. Then below we have shoulders adapted to receive the streamlets from the diaphragm 56.

Now I direct your attention, your Honor, to the holes in this diaphragm, which are oblique—they are not ver-

tical—so that the stream will be directed against the wall of the device, as shown in the drawing, so that the water, entering the mixing chamber with substantial velocity, surrounded by air, breaks up first against the walls of the device and then, after the first breaking up, goes through screen 62 and is discharged as a coherent stream having bubbles.

Now I am holding in my hand the sample of Figure 6 and I shall show the parts. At the upstream end we have a diaphragm with a series of holes. These holes (Tr. 76:)

are oblique, as the pin I am going to insert will show; it doesn't stay vertical. These holes are oblique so that the streamlets issuing in the mixing chamber would be directed against the wall or against the shoulder below and break up, as provided by this invention. Below this diaphragm we have, as before, the air vents, and below the air vents we have the shoulder and the screen, as I just described, so that the water issuing from the diaphragm will break against the plain surface, against the solid surface, and then further be broken up by the screen and discharged as a coherent stream.

Q. Then what elements constitute the resistance to the streams of the jets, the high-velocity jets?

A. The solid surface inside the mixing chamber is the first resistance that the streamlets issuing from the diaphragm find in their path, and then there is additional resistance offered by the screen below, number 62.

So the one breaks up and the other makes the water broken up into a coherent stream.

Q. Will you please rephrase that? I don't think it's quite clear.

A. Well, in this Figure 6, the streamlets issuing therefrom—

Q. I don't want to go back that far. It's just that last (Tr. 77:)
sentence.

A. The streamlets find in their path a solid surface and break up, and then they are further broken up by the screen below.

Q. You said something about issuing as a coherent jet.

A. Then the water issues as a coherent stream, having air bubbles disseminated throughout the jet.

Q. Do you have a sample in accordance with Figure 5?

A. Figure 5—no, I don't.

Q. Figure 7?

A. Figure 7—I do not.

Q. What about Figure 8?

A. Figure 8 is not an aerator.

Q. What is it?

A. For making soft drinks, mixing the liquids.

Q. Now you discussed here the Softflo, made by the Chicago Faucet, the Spring-Flo, made by the Chase Brass, and the Velva-Flo, made by Firestone. Now can you give us a figure as to what the commercial production by your licensees has been?

• • • •

(Tr. 79:)

The Witness: No, these figures are correct. For instance, Chase Brass sold 16,359,000 units and they paid royalties on those units; Chicago Faucet sold 876,678 units and paid royalties on all those units;
(Tr. 80:)
Firestone Company sold 4,499,532 units and they paid royalties until 1954, when they wrote a letter saying that—

Mr. Freeman: I object to what the letter said; it's not the best evidence.

• • •

(Tr. 81:)

Q. (By Mr. Ely:) Now, Mr. Aghnides, we have the sample of the Mel-O-Flo aerator—I think it's Exhibit 19—and we have a chart—

Mr. Ely: I am going to offer that chart which has just been put on the easel.

(The chart referred to was received in evidence as Plaintiff's Exhibit 33.)

The Court: What is that headed?

Mr. Ely: It is headed "Comparison of Melard Mel-O-Flo Aerator with Aghnides 2,210,846."

• • •

(Tr. 82:)

Q. (By Mr. Ely:) Made by Melard Manufacturing Company and sold by this defendant?

A. That's right.

Q. I want you first to say what the function and behavior of that aerator, in a general way, before you go into the details of it.

Mr. Freeman: That is, if he knows.

Mr. Ely: I think the gentleman knows. Go ahead.

A. This aerator, called Mel-O-Flo, that I am holding is attachable to faucets equipped with a thread and produces a stream of water loaded with air bubbles, a white stream of water which is full of air bubbles which aerate the water; and then the stream, like my stream is soft, has faster and better washing and rinsing quality, due to the air bubbles suspended in the stream, exactly what my aerator does. When the water is drawn through this

aerator the bubbles escape and you have aerated, more palatable water, as my own invention provides.

Q. How does the air get into the water in the bubbly stream that you have been talking about?

(Tr. 83:)

The Witness: At the upstream end of this device, the Mel-O-Flo, there is a diaphragm with small orifices through which the water from the faucet goes, is delivered, and below the diaphragm there is a casing with lateral holes for the admission of air, and below those lateral orifices for the admission of air there is a resistance formed by the screen, so that the performance of this aerator is the delivery of naked streams in an open chamber to receive free atmospheric air and then to strike the inner walls of the casing and then further break up at the screen at the discharge end of the device and emerge as a coherent, bubbly stream.

Q. (By Mr. Ely:) Suppose we come down to the chart, Plaintiff's Exhibit 33, and, if you will take the pointer and

(Tr. 84:)

take the article along with you too, will you please show to the Court first the various elements—

The Court: Wait just a minute before he gets on to that. You have not described this diaphragm.

The Witness: Yes. This diaphragm here is formed by a ring and the plate that is seated in that ring. The plate is provided with teeth so that when the plate is seated in that ring the space between the teeth and the ring forms openings through which the water goes with high velocity.

The Court: But the piece itself is not perforated like the screen (diaphragm?) in yours?

The Witness: No.

The Court: It has openings around the border of the piece through which the water can escape downward?

The Witness: When the parts are hooked together, then we have perforations formed by the division of two parts.

The Court: What do you call this piece that is seated in that ring?

The Witness: I'd call it a plate.

The Court: It appears to have something fastened to the bottom of it so as to give it a flat effect of some kind. What is that?

The Witness: That is the resistance when the water comes out at the lower end of the ring, slides (Tr. 85:)
over the onion-shaped body, and is deflected against the walls of the casing. So this arrangement is, as in my Figure 6, to deflect the streamlets delivered by this combination forming the diaphragm to the lateral walls of the casing in the way my Figure 6 does, so that the streamlets emerge from the lower end of the ring and, because of the curvature of the onion-shaped body, as the drawing will show in this enlarged form, they are deflected and they strike the lateral walls of the main casing. So they break up there against the walls of the casing and then they are further mixed by the screen below.

(Tr. 86:)

Q. (By Mr. Ely:) Is there any resistance in the paths of the streams of water as they issue from the disc 36'—first tell me is there resistance in the paths of the streams of water as they issue from the openings 36'.

A. Yes.

Q. What constitutes the resistance?

A. We have the onion-shaped body over which the water has to slide and strike the inner walls of the casing. So that is one resistance, the onion-shaped body. And then, further, we have the walls of the casing shown by numeral 40. So the water strikes up against the wall 40 and then falls on the screen 42, which further breaks and mixes the air with water, and then the result is a foamy stream, coherent and bubbly.

Q. Where are the air ports? First, what is the chamber marked on this chart?

A. The Chamber is marked "C".

Q. Where are the air ports?

A. The air ports are in the upstream direction—the air ports are below the diaphragm delivering the water in forceful streamlets.

(Tr. 87:)

Q. And those air ports are marked 38?

A. They are 38; that's right.

Q. You said something about the claim. Take over here on this chart and compare the two, Figure 4 and the Melard aerator, as illustrated on that chart.

A. Claim 1 of Patent 2,210,846 reads as follows:

> "A device for producing a coherent jet of water containing air bubbles, comprising a chamber (C)"—

Q. Point that out.

A. Here we find a chamber C on the Melard aerator and we find a chamber C on my aerator.

Q. Figure 4?

A. Figure 4. "the inlet end (34)"— We have the inlet end 34 in both cases—"of which is adapted for connection with the discharge end of a tube containing water under pressure and the outlet end (32) of which is adapted to discharge the said coherent jet"—

Q. Is that in both?

A. In both we have the outlet end 32—"a diaphragm (36)"—here we have a diaphragm 36 in both cases—"at the upstream end of the chamber"—in both cases it is at the upstream end of the chamber—"having at least one orifice"—both have a plurality of orifices—"through which the stream of water is adapted to be forced into the cham-
(Tr. 88:)
ber with substantial velocity"—in both cases the stream of water from diaphragm 36 is adapted to be forced with substantial velocity into chamber C—"an air port (38) opening into the chamber through which air is induced by the stream of water"—now we have air port 38 in both cases—"and means (40, 42) in the path of the stream"—here we have the means 40 and 42 in Melard, as we have the means 40 and 42 in my aerator—"in the path of the stream of water after it leaves the orifice and before it discharges at the outlet end"—in both cases after it leaves diaphragm 36 and before it is discharged through the outlet end 32—"for finely breaking up the water and for offering sufficient resistance for thoroughly mixing it with air and for thereafter uniting the aerated water to form a coherent jet having small bubbles disseminated throughout the jet."

Q. Now Claim 4, "The device of claim 1 in which the said means comprises a screen (42)", we don't have to go all through the claim, but just point out the screen.

A. Yes. Claim 4 of my patent says "The device of claim 1 in which the said means comprises a screen (42)"—which we have in both cases—"at the discharge end of the chamber C"—C and C—"the openings in which are sufficiently close together so that the streams of aerated water issuing therefrom immediately join each other to form a
(Tr. 89:)
single jet." And both screens are of that type.

Q. Now will you compare the operation of this device with Figure 6 of the patent, show the Judge any correspondence you find between the Mel-O-Flo aerator and Figure 6 of the patent?

A. In Figure 6 of my patent we have diaphragm 56 which has orifices so inclined, as one can see, as to direct the streamlets against the wall of the casing downstream of that diaphragm 56. In the Melard aerator we have below the openings in the diaphragm an onion-shaped body adapted to deflect the water in the same direction as my disc does, in other words, against the wall of the casing which is down below, so that in both cases the water breaks against the walls or the shoulder therein before reaching the screen which is below at the outlet end of the device, which we also find in both constructions, in the Melard aerator and in my Figure 6. So we both have a diaphragm adapted to divert the stream of water into the chamber at high velocity, break against the wall of the casing, and in both cases we have the same condition after that breakage, which is the provision of a screen below for further breaking up the water and producing a coherent stream.

* * *

(Tr. 90:)

Q. (By Mr. Ely:) Now let's take a look at your second patent, Mr. Aghnides, 2,316,832. Have you got that?

A. Yes.

Q. What was the purpose of the second patent; what was accomplished by the second patent?

A. Well, the purpose of my second patent is clearly described on page 1, column on the right, third paragraph.

Q. Would you mind calling his Honor's attention to it?

A. Which reads as follows: "'I have found that when the water is discharged through a restricted orifice, as at 17, Fig. 1, at 22, Fig. 2, and at 32, Fig. 3''—it is marked by

mistake in the patent Figure 6, but there are only three figures, so I shall read "at 32, Fig. 3"—"that the flow (Tr. 91:)
through the orifices in the upstream diaphragm is improved and a more regular and softer jet is delivered from the outlet end of the device." So that is the purpose of my second patent.

Q. Will you point out to his Honor the construction in Figures 1 and 2?

A. In Figure 1 of the Patent 2,316,832 I have shown by numeral 17 the restricted orifice which is the embodiment of this patent and which restricted orifice is immediately upstream from diaphragm 18.

Q. Which of your commercial devices has that in it?

A. The Firestone aerator, Velva-Flo, is built exactly according to Figure 1.

Q. Now you say the restricted orifice was one of the means, as I understand it, of smoothing out or making more regular and softer the jet; the restricted orifice was one of the means. Another means, you said, was the second upstream diaphragm?

A. Yes. I found I could produce that softening or evening up of the stream by the use of either the restricted orifice, as shown in Figure 1 by 17, or by using a second perforated diaphragm upstream of the first one, as shown in Figure 2 of said patent by numeral 23.

Q. Figure 2 also shows—what is the element 21?
(Tr. 92:)

A. 21 is the coupling, with a restricted orifice 22, so that the combination of the restricted orifice and of the second disc are shown together in Figure 2, in the cross section Figure 2.

Q. Let's take the Mel-O-Flo aerator, if you will, please. Do you find in the Mel-O-Flo aerator the two diaphragms?

A. I do.

Mr. Ely: Now, if your Honor please, I am going to introduce a chart, Exhibit 35.

(The chart referred to was received in evidence as Plaintiff's Exhibit 35.)

Q. Now will you point out, please, where you find, if you do, the two diaphragms in the device illustrated in this chart which has been marked Exhibit 35?

A. If we look at the left we see in the Mel-O-Flo aerator where numeral 23′ are the orifices in the first diaphragm. Then downstream of these orifices we have a second opening, which is shown by numeral 24, exactly what I have shown in Figure 2 of my patent 2,316,832. I have the main diaphragm below, shown by 24, and upstream of diaphragm 24 I have the second diaphragm 23. So in both cases the water traverses first a diaphragm having a restricted orifice 23 in both cases and then traverses the second diaphragm shown by numeral 24 in both cases and enters the mixing chamber and strikes the walls, means for breaking up the water. (Tr. 93:)

Q. I believe you have a chart in which you have colored those two diaphragms in the Melard aerator.

Mr. Ely: I am going to ask that that be received as Exhibit 36.

(The chart referred to was received in evidence as Plaintiff's Exhibit 36.)

Q. Now will you explain to the Court what you intend to show by that?

A. In this copy here we have shown in black (purple) the two diaphragms in the Melard aerator. We have diaphragm with opening 23′, which is the second upstream

diaphragm, and which is shown in my device by 23, and below the opening 23', the first diaphragm, we have the disc 24 with the space in between as in my own construction where also there is a second diaphragm below the first one and the two restricted orifices of the diaphragms are somewhat spaced from each other.

Q. Will you please take that claim 4 of that patent and show how it is readable on the Melard aerator?

A. Yes. We have here on this chart, Exhibit 35, claim 4 of my patent 2,316,832, with cross sections of the Melard aerator and my aerator, Figure 2 of said patent. The claim reads: "A device for producing a jet of water containing air bubbles comprising a chamber (C)"—and we find that chamber C in both constructions—"the inlet end (Tr. 94:)
of which is adapted for connection with the discharge end of a faucet or the like"—and we find both connected with the faucet—"and the outlet end of which is adapted to discharge said jet"—we have in both cases the discharge end at the down stream end—"superposed apertured diaphragms (23, 24)"—we find those superposed apertured diaphragms 23 and 24 in both cases—"at the upstream end of the chamber through which water is adapted to be forced into the chamber with substantial velocity"—that is what happens in both cases—"an air port (25)"—here we have an air port 25; there we have an air port 25—"opening into the chamber"—in both cases they open into the chamber—"through which air is induced by the water delivered from the apertured diaphragms and means (26, 27, 28)"—here we find the means 26, a part of the onion; then we find the wall 27, and the third resistance, which is the screen 28; and here in my aerator, Figure 2, we find resistances 26, 27 and 28 formed by the three screens shown at the downstream end of the device.

Q. Now, if you will go back, let's look at that Mel-O-Flo aerator again, please, sir. Put it together with the adaptor. As I understand, you said there was a restricted orifice in this second patent that also performed the function of smoothing out, or taking out irregularities, or softening (Tr. 95:)
the stream?

A. Yes, sir.

Q. Is there a restricted orifice in that Melard aerator?

A. Yes, like the Figure 2—

Q. Tell the Court what it is.

A. Here I am holding the Melard aerator, which has at its upstream end a very restricted orifice through which water from the faucet enters and reaches the diaphragms below.

Mr. Ely: We have a chart here which I am going to offer in evidence as Plaintiff's Exhibit 37.

(The chart referred to was received in evidence as Plaintiff's Exhibit 37.)

Q. Going to the chart, will you point out on the chart the elements?

A. Yes. Here on this chart we have again vertical cross sections of the Melard aerator at left end of my areator, Figure 2 of patent 2,316,832. We see in both cases the restricted orifice 22. Then downstream of that restricted orifice 22 we see in both cases superposed aperture diaphragms.

Q. They are the same as in connection with the other claim, are they not?

A. Yes. Then we have the resistance means in the discharge end. Now if we read this claim 2 of my patent we see that the Melard has all the elements in the function

(Tr. 96:)

described in this claim 2. Claim 2 of Aghnides 2,316,832 reads as follows: "A device for producing a jet of water containing air bubbles comprising a chamber (C)"—we have a chamber C in both cases—"the inlet end of which is adapted for connection with the discharge end of a faucet or the like"—and we see both connected to a faucet—"and the outlet end of which is adapted to discharge said jet, an apertured diaphragm (23)"—here we see 23 in both cases—"at the upstream end of the chamber through which water is adapted to be forced into the chamber with substantial velocity, an air port (25)"—here we have an air port 25 in both cases—"opening into the chamber through which air is induced by the water delivered from the apertured diaphragm and means (26, 27, 28)"—here we have means 26, 27 and 28 in both cases—"in the path of the water after it leaves the apertured diaphragm and before it discharges at the outlet end for finely breaking up the water and mixing it with air to form a coherent jet having bubbles and a restricted orifice (22) upstream the apertured diaphragm."

Q. Now, Mr. Aghnides, are you ready to demonstrate the several aerators we have been talking about here?

A. Yes.

(Brief recess taken.)

(Tr. 97:)

Q. (By Mr. Ely:) Now we are at the demonstration tank in the courtroom. I am going to ask Mr. Aghnides first to describe this tank, and I am going to mark the tank as the next exhibit, 38.

• • •

(Tr. 98:)

Q. (By Mr. Ely:) Now I wish you would start the tank going, and the first thing I want you to demonstrate is the Spring-Flo aerator, Exhibit 29. What pressure are you going to work this—

The Court: That is the Chicago device?

Mr. Ely: No, sir, that is the Chase Brass.

A. These demonstrations are made under thirty pounds pressure, about the average water pressure in the homes. Frankly, nobody knows the exact pressure. That is the pressure we used before and it is adequate to operate each device fully and supply all the pressure and water necessary for functioning of each device. So, for point of comparison, we might show on the gauge each time a pressure of thirty when the water is flowing through the device.

Q. All right, start it up.

A. Now we have the Spring-Flo in operation and one can see a snow-white stream saturated with air bubbles, a condition necessary to effect a true aeration of the water. When we place an object in the white stream we see the object enveloped by the stream without any splashing and

(Tr. 99:)

with millions of bubbles covering the object.

Q. What is the object?

A. The object I am using here is a jar, half a gallon big, just to provide a surface.

Now I would like to show how this water flows into a glass when drawing a glass of water. We shall see the thoroughness of aeration when we think the glass is full (demonstrating).

Q. Shut it down and tell us what you did.

A. When the stream was flowing I place a glass under the stream until the glass was full and then pulled away the glass to show all the bubbles escaping and to show also that only a portion of the glass is filled with water, the rest being air, showing the extreme thoroughness of aeration.

The Court: All right, do that again.

The Witness: (Demonstrating with glass.) When the glass is being filled one can see that every particle of the water comes in touch with the air and almost half of the glass is empty, due to the bubbles escaping.

Q. (By Mr. Ely:) Now the next one I want you to do—

The Court: Before you leave that, what do you claim is the advantage of doing that?

The Witness: I claim, and it is accepted in science, that when the water comes into close contact with (Tr. 100:)

air, first of all, a part of the oxygen of the air is dissolved into the water; second, when those bubbles are escaping they carry away a great deal of odors due to chlorine and other gases; so it is more palatable because, first, the taste is improved by removal or decrease of the bad odors, and, second, by addition of the dissolved oxygen. These are the reasons for which industry aerates water at the source before delivering to the cities, but then that water, after being aerated at the source, goes through the pipes and loses a great deal of its benefit, but this aerator has the added ability, which was never seen before, to provide a stream of water with bubbles, and when you are using the stream during

its flow either for washing your hands or washing dishes or glasses or projecting that bubbly stream into a soap solution, you get a tremendous amount of lather. If you are rinsing your hands or dishes you rinse much faster because every cubic inch of this water has swelled into several inches of foam; in other words, this device increases the volume of the product delivered through it, which is water plus air. We know that when we have a glass of beer and the foam falls down the whole thing disappears; in other words, when you swell a parcel of water with bubbles you create a much bigger volume and that volume, when running over objects, as the white (Tr. 101:)

stream does when you are washing, washes with less water in less time; and if it's flowing through soap solution those bubbles, with the soap, produce a tremendous amount of lather, because lather is nothing but air and water plus soap. Until now the housewife had to agitate by hand to create some lather from soap, but here the millions of bubbles of equal size do create through soap solution the creamiest lather ever seen. So the stream itself has features never seen before, never used before.

Q. (By Mr. Ely:) What about the feel of the stream?

A. The feel of the stream is splashless and most pleasant, which seems to please the public, and, due to the tremendous amount of air—if your Honor will put your hand in the stream—these bubbles cushion the impact and make the stream softer. There are two series of advantages, one due to the bubbly stream, the other due to the aeration of the water; and, as the bubbles have escaped, by that time you have a bubble-free, better tasting, more palatable water.

Q. The next thing I have on my list is to demonstrate the Mel-O-Flo aerator without the adaptor. When you take the adapter off, when you take that rubber top known as the adaptor off, then you can screw the aerator directly on the faucet?

A. This is Exhibit 19. Here we have the defendant's (Tr. 102:)
aerator adapted for the faucet and operating under the same conditions and giving also a stream in every respect the same as my stream; in other words, it is a white stream loaded with air bubbles, soft to the touch, and, naturally, aerated water, water which is better for drinking purposes.

The Court: Let some of that run in your glass just like you did the other; demonstrate that.

The Witness: (Demonstrating) Here also about the same result or degree of aeration.

Q. (By Mr. Ely:) Now you have some others, and I'd like you to go through the same demonstration.

A. When we place an object—and I am using the same jar, half-gallon size—we see the object covered with a non-splashing, quiet, foamy stream, covering the object with bubbles all over.

The Court: Right here, while I am thinking about it, take off the attachment and run some water through and let's see how it is where you don't have either attachment.

(Witness demonstrates, placing jar in stream produced by faucet without attachment.)

The Court: Now catch some water in the glass the same way.

(Witness demonstrates, filling glass from stream produced by faucet without attachment.)

(Tr. 103:)

Mr. Ely: I want him to make a comment on that.

The Witness: We saw, when I placed the jar—

The Court: Taking both fixtures or attachments off and letting it run without attachment?

The Witness: Yes, sir, I removed the aerator from the faucet and let the ordinary water, without any attachment, fill the glass, and we saw that the glass was practically full when I removed it from the faucet. As the stream did not contain any air bubbles, the glass was filled with water and there was no room for the glass to get instantly half empty by escape of bubbles, which did not exist in this case.

Then I placed in the ordinary stream without any attachment the half-gallon jar and we saw the stream splashing and without any bubbles covering or enveloping the jar, in distinct difference with what I had demonstrated before.

Q. (By Mr. Ely:) The next thing I have here is model of Figure 4 of the first patent in suit, Exhibit 28.

(The witness demonstrates with jar and glass, the faucet being equipped with Exhibit 28.)

Q. Now tell us what you did and what happened.

A. I repeated the experiment by putting under the aerator according to Figure 4 of the patent a glass and I filled it and, as in the previous case, the glass was half empty when I pulled it away from the stream, due to the amount of bubbles in that stream. Then I placed under

(Tr. 104:)

that stream of that aerator, Figure 4 of the patent, the half gallon jar, to show that the bubbles here again were covering the surface of the jar.

Q. Now the next thing I have is to demonstrate the model of Figure 6. That is Exhibit 32.

(The witness demonstrates with glass and jar, the faucet being equipped with Exhibit 32.)

Q. What do you have to say to that?

A. I have demonstrated now Figure 6 of my patent, built exactly as the drawing shows, and I put the glass under the stream and I obtained a much less aeration than before. Then I placed the jar in the stream and I obtained bubbles covering the jar about as before; it's hard to say.

Q. Now let's see the Velva-Flo. That is Exhibit 31.

The Court: Whose make was that?

Mr. Ely: Velva-Flo was Firestone's.

(The witness demonstrates with jar and glass, the faucet being equipped with Exhibit 31.)

The Witness: Now I demonstrated the rubber attachment embodying Figure 1 of my patent, made by Firestone Tire and Rubber Company—

Mr. Freeman: May we have the patent number? There are two patents here involved and my cross examination is going to segregate those two patents. (Tr. 105:)

Mr. Ely: The first patent.

The Witness: Embodying two patents, though, embodying the second patent.

The Court: He said that top piece put in the Velva-Flo embodied the principle in his second patent.

Q. (By Mr. Ely:) You said this was Figure 1 of your first patent?

A. Yes, sir.

Mr. Freeman: But it isn't, though.

The Court: It showed, when he pulled it apart, that in the top of it it embodied his second patent also.

The Witness: As before, I placed in the stream a glass which, when pulled away, emptied itself almost halfway, showing the degree of aeration. Then when I placed in the stream the half-gallon jar we again saw the bubbly stream splashlessly covering the surface of the jar.

Q. You spoke a couple of times when you were on the stand about the naked streams, that is, that you had the streams going down to the chamber completely surrounded by air. Do you have a way of showing that to his Honor?

A. I do.

Q. What are you going to do?

A. I am going to use an aerator where I cut off the wall (Tr. 106:)
above the screens so that one can see the naked streams striking the screens below without any flooding from the side orifices.

Mr. Ely: I want to introduce this as Exhibit 39.

(The model referred to was received in evidence as Plaintiff's Exhibit 39.)

Q. Will you show his Honor just what Exhibit 39 is?

A. I have taken a rubber connector, and I placed in it the diaphragm from the Velva-Flo aerator made by Firestone.

The Court: Is there any screening in the upper part of this exhibit here; is that open, just a restricted orifice there?

The Witness: It is a restricted orifice above the main diaphragm. So the two patents are embodied in the rubber connector.

The Court: Is there any screen in the rubber part of it?

The Witness: No screen. There is a disc, as I shall open and show it to you. There is a diaphragm, as provided in my patent, attached at the lower end of the connecting part to the faucet, and below that diaphragm I have the screens used in the Velva-Flo. Above those screens there is not any wall, to show that this chamber is not flooded, so when I shall place this aerator on the faucet, of course, we will see (Tr. 107:)

that the water goes through, breaks up by these screens, and discharges as a coherent stream without flooding the chamber between the diaphragm and the screens.

Q. (By Mr. Ely:) Put it together and then put it on the faucet. Now what are you doing? You are putting Exhibit No. 39—

A. I am putting Exhibit 39 on the faucet and operating under the same pressure, thirty pounds.

(Witness demonstrates with glass and jar.)

Q. Now tell us on the record what you did, Mr. Aghnides.

A. I demonstrated an aerator where the space between the resistance and the diaphragm upstream of said resistance was completely open to the atmosphere and showing that the mixing chamber is not flooded; that those streams strike the resistance below, those streamlets having high velocity strike the resistance below while surrounded by free air, not in a flooded chamber. This is the

fundamental difference, because so much free air around is mixed in abundance with the streams that break up and tap the air that goes through the device, producing the result we have seen; and the result was, as before, the glass was half empty when we thought it was filled, and the stream flowed over the half-gallon jar with the same smoothness and enveloping way.

(Tr. 108:)

Mr. Ely: At this point, your Honor, we have a drawing of the device which was just demonstrated, and I am going to ask that that be marked Plaintiff's Exhibit No. 40.

(The drawing referred to was received in evidence as Plaintiff's Exhibit 40.)

Q. Now you have another model, don't you, to show these naked streams?

A. Yes, I do.

Mr. Ely: This device we have here I am going to mark as the next exhibit, Plaintiff's Exhibit 41.

(The model referred to was received in evidence as Plaintiff's Exhibit 41.)

Q. What is that, Mr. Aghnides?

A. This is an aerator built according to Figure 4 of my first patent. It was built of transparent material except for the diaphragm and the screens and the coupling to put onto the faucet. It has a plurality of screens downstream the diaphragm and then, in the space between the diaphragm and the screens, there are orifices for the admission of air, just like Figure 4 that I described before.

Q. Figure 4 of your first patent?

A. Figure 4 of my first patent.

Q. How many diaphragms downstream do you have?

A. Just one diaphragm downstream.

(Tr. 109:)

Q. Any restricted orifice upstream?

A. No.

Q. Turn it on. Are you putting the flashlight on it?

A. The flashlight is directed on Figure 4 of the first patent to show that the streamlets delivered by the diaphragm in the chamber of the device are naked streams surrounded by air.

Q. Do you want to go through your same demonstrations?

A. Also I would add that one can see that the chamber is not flooded because, otherwise, the water would come out of the lateral orifices.

(Witness demonstrates with glass and jar.)

The Court: Why did that splash out more than the other?

The Witness: If I increased the resistance inside, as the patent teaches, it would be a better proportioning, but this device is built roughly to demonstrate the naked streams inside. We could put one more screen to demonstrate that, as the patent says, it functions better with two or more screens.

Q. (By Mr. Ely:) Have you got another screen to put in there?

Mr. Freeman: We might, for the purposes of the record, state how many screens were in there with the demonstration just made.

(Tr. 110:)

The Court: What have you got in there?

The Witness: Two.

The Court: What are you doing now?

The Witness: Now I am adding one more screen so that I shall have in this device three screens instead of two. I am spacing these screens by means of a ring, and now I shall put it on the faucet to show that the stream will become softer.

The Court: Is it correct to say that you have added one ring and one more screen?

The Witness: Yes.

(Witness demonstrates.)

You see, you have a much evener stream by the addition of the screen. The screen creates the resistance proportioned with the upstream diaphragm. I shall demonstrate the results of this stream.

(Witness demonstrates.)

The Court: What do you observe to be the difference?

The Witness: The difference is that this stream flows more evenly because the resistance offered by the screens and the diaphragm has been better proportioned.

Mr. Ely: Wait a minute. You didn't mean that —the resistance offered by the screens and the diaphragm?

(Tr. 411:)

The Witness: And the velocity of the streamlets emerging from the diaphragm have been better proportioned. As I had demonstrated before, it was according to Figure 4 of the first patent, but, as the patent teaches that two or more screens give even a smoother stream, I added one more screen and I demonstrated again and I obtained a glass of water which emptied a great part of its volume instantly, and also we have seen it flows smoothly, without

any splash, over the half-gallon jar I put in the stream.

Q. (By Mr. Ely:) Now his Honor asked a question while you were on the stand why the water didn't come out of the air ports and you said something about the proportioning that made it so that the water went through and didn't come up through the openings, the air ports. Do you have a device here to illustrate that to his Honor—and tell us what it is?

A. Yes, indeed. Here I am holding the Firestone aerator in which I have added three screens; in other words, it has its normal screen resistance plus the three screens I added to increase resistance in the path of the water emerging from the diaphragm upstream of the screens.

Q. How many screens has that got in it now?

A. Now this aerator has six screens.

Mr. Ely: I am going to offer that as Plaintiff's (Tr. 112:)
Exhibit 42.

(The model referred to was received in evidence as Plaintiff's Exhibit 42.)

The Witness: I will show the Court that if in this construction of my aerator principle you put too much resistance the chamber will be flooded and the water will squirt out of the orifices provided on the sides for the admission of air.

(Witness demonstrates operation of Exhibit 42 on faucet.)

Q. (By Mr. Ely:) Can you tell what is happening?

A. One can see that the chamber where the screens are is flooded, because the water is squirting out of the lateral

orifices and the stream contains no bubbles whatsoever. There is no aeration taking place because the device is not proportioned according to my patent.

Q. That is to say, in this case, when you had Exhibit 42 with the additional screens, there was no aeration of the water?

A. That is what I said.

Q. And the water was coming out of the air ports?

A. That is what I said. If we take those screens off, just to show that this aerator is a normal Firestone aerator—

Q. What are you doing now; taking those additional (Tr. 113:)
screens out?

A. Yes, I am taking those additional screens out, so that it is now as made by Firestone.

(Witness demonstrates operation of Exhibit 42 on faucet, with three screens removed.)

The Witness: We have a stream, as we saw before, full of bubbles, and no water squirts out of the lateral air vents.

Mr. Freeman: Mr. Ely, with the consent of the Court, I wonder if we could put in one more screen and show how it works with four, and with five, and possibly with two and with one. We could possibly save a lot of cross examination.

The Court: I don't object to it.

Q. (By Mr. Ely:) He wants you to take them one at a time. How many have you got in now?

A. I have one screen added to the standard Firestone aerator, and there is still good aeration (referring to operation of exhibit on faucet).

Mr. Freeman: Four screens in all?

The Witness: Yes.

The Court: That's two in the escape part, is it not, in this bottom part?

The Witness: Three; and one more makes four, a total of four.

Mr. Freeman: Could we have the same demonstration with the glass and the jar?

(Tr. 114:)

The Witness: We did not have it with the jar and glass before.

The Court: Go ahead and demonstrate with the glass and the jar.

The Witness: (After demonstrating.) Now I demonstrated the Firestone aerator with one additional screen, which makes a total of four screens. The result is still a smooth stream but less air in the stream, because we see the glass is not emptied as much as when we tried before the standard Firestone aerator.

Q. (By Mr. Ely:) "Is not emptied as much"—I wonder if that is going to be understandable. You mean the amount of space occupied by the air is less—I don't know just how to put that—there is more water and less air?

A. Yes, more water remaining in the glass.

Q. Put in two screens.

A. Now the aerator has five screens.

(Witness demonstrates with Exhibit 42 on faucet.)

Q. What happened?

A. We have now an aerator with two added screens, so it makes a total of five screens, and we see that there is even more water remaining in the glass; in other words, the degree of aeration has decreased.

(Tr. 115:)

The Court: What effect did it have on the air vents?

The Witness: The air vents were still in operation, so the stream still had bubbles. We were approaching a critical point, but the device still gave a stream having bubbles, but, as the glass test showed, the stream had much fewer bubbles than before.

Q. (By Mr. Ely:) Was water coming out of there?

A. Water was not coming out.

Q. You didn't see it; it was on our side. Put it on again.

A. (Demonstrating again.) I said it was approaching the critical point. Some water started squirting out of the lateral vents, but there was still some aeration.

Now when we add a third screen to the Firestone aerator, making a total of six screens; the chamber inside the aerator is completely flooded and the water squirts out of the air vents and the stream of water has no bubbles whatsoever (demonstrating again).

Mr. Freeman: Could we put that on properly? It isn't moved up to the proper position. Is that because the screens won't let it go up?

The Witness: Yes.

Mr. Ely: I think that is all the direct.

* * *

(Tr. 134:)

Q. (By Mr. Freeman:) Do you have a copy of the Felten patent which you referred to yesterday in your direct examination?

Mr. Ely: It is an exhibit, isn't it?

Mr. Brooks: It is Exhibit 24.

• • •

(Tr. 135:)

Q. (By Mr. Freeman:) How is the air and ozone brought into the apparatus wherein it is mixed?

A. What do you mean by "how"?

(Tr. 136:)

Q. Well, what are the physics by which the ozone and air are brought into contact with the water?

A. In this device?

Q. Yes; I am speaking only of Felten.

A. Well, this device is a lateral pipe, as is shown in Figure 1. That lateral pipe is connected with a container where ozone is produced, and then the ozone produced and the air in that container are sucked in in that injector, and the suction created, as Felten describes, by the widening of the Chamber E, which is responsible for creating the vacuum and effecting the suction.

Q. In other words, there is a jet of water that flows into the chamber E; correct?

A. Yes, but that chamber E is flooded, so the jet—

Q. I didn't ask you that—

The Court: Let him answer. He said, "Yes, but."

The Witness: In other words, you said the jet flows into chamber E, and I said no, because the chamber E being flooded, the jet is no more a jet. The jet is as wide as the orifice, as the black portion of chamber E shows, so you don't have a jet entering chamber E and striking the disc F, because that chamber is flooded.

• • •

(Tr. 152:)

Q. (By Mr. Freeman:) How about Figure 8?

A. Figure 8 is not an aerator.

Q. What is Figure 8?

A. Figure 8 is for mixing three liquids for making soft drinks.

Q. Do you find anything in the specification of your patent that Figure 8, aside from taking in two different

(Tr. 153:)

things through the openings in the side, operates any differently than Figures 1, 2, or 7, by way of example?

A. Yes, I do.

Q. Where do you find that?

A. Well, when I read the description of Figure 8 I see that there is no reference made to bubbles, there is no reference made to water, to air, and Figure 8 shows those two lateral pipes, which indicate that the air orifices—I mean the orifices on the side—are for connection to some container. So the picture shows that there are two connecting means for connecting the device with two different sources of liquid, plus the connecting means on the top. Then the description of Figure 8 does not make reference to air, whereas the description of every other figure in this patent says air and water and bubbles. Moreover, if you wish to open the patent application, you will find that was for three liquids.

Q. Open what?

A. That abandoned specification, Figure 8, you will find that was for three liquids.

Q. I find the only description for Figure 8 starting on line 11, page 2, column 2, of your patent and continuing on down to line 46. Is that correct?

A. Yes.

(Tr. 154:)

Q. And it is your position that because there is no ref-

erence to air bubbles it is some different type structure?

A. Oh, definitely.

• • •

(Tr. 158:)

Q. (By Mr. Freeman:) You now disclaim any of the claims as readable upon what is shown as Figure 8?

A. I definitely do.

Q. Now I am going to ask you to look at Figure 8 and tell me whether or not you there find a diaphragm having at least one aperture in it?

A. Yes.

Q. And that aperture is given what reference numeral?

A. In other words, I would say the equivalent. I find one orifice, but I don't find a diaphragm; find one or more

(Tr. 159:)

orifices.

Q. Is it your position that because the member is rather solid as distinguished from a thin plate it is no longer a diaphragm?

A. No; I said the equivalent.

Q. It is the equivalent?

A. Yes.

Q. Do you find directly below the aperture—

A. Which aperture are you referring to?

Q. Well, it can have four apertures or a single aperture. I am just taking one aperture, or you can take all four.

A. There are numerals; we might refer to the numerals to make it clear.

Q. The openings that I referred to are the apertures 74, which you can see in Figure 9, which is a sectional view taken on line 9 of Figure 8.

A. Yes, you are referring to opening 74. All right.

Q. There you have in vertical position, as the drawing shows, openings that are directly below the screw-threaded

portion at the upper end which is adapted to be fastened to some tap or other device; correct?

A. Yes.

Q. And through those openings, under the pressure of the fluid from above, there is discharged a plurality of jets of liquid, water, under high pressure or velocity? (Tr. 160:)

A. Yes.

Q. And those jets of water draw in air through the inlet ports 76 and 77; correct?

A. When they are left open, yes.

Q. Well, even in the Chase device, if you close up the air ports no air gets in?

A. No; but the difference is these are to be connected to a closed container.

Q. That has some air in it?

A. So, to make the statement correct, if it's operated as it is intended, it will not be. So I make the point that if you want to operate it differently by leaving them open, then, I said, yes, there will be air.

Q. Now, so that we understand each other, if you connect the ports 76 and 77 to two containers, then as the water passes through the apertures 74 it will draw whatever air is in those containers downwardly along with the water; correct?

A. Yes.

Q. And if the two ports are open to atmosphere, as distinguished from the containers, it will suck in air from atmosphere?

A. Right.

(Tr. 161:)

Q. The air and water will then pass downward and initially strike against baffles 78; correct?

A. "Strike" is not correct, because they shall find in their path the baffles 78; in other words, the initial velocity

of the stream of water going through the orifice 74 has been lost because this chamber 74, the conical chamber, is already flooded. So it has decreased velocity, the chamber is under pressure to create a piston effect, and then the water goes into the chamber where the screens are.

Q. Isn't it a fact that your patent specification states, quoting—and I am reading from page 2, column 2, line 35: "Baffles 78 project into the passages at the point where the passages discharge into the mixing chamber. The baffles in part interrupt the course of the fluids in each passage and thereby serve to effect a preliminary mixing of the fluids." Is that correct?

A. Yes, naturally, because the baffles interrupt the flow so that the chamber would be flooded, and whatever amount of air has been there, naturally it is in contact with the liquid.

The Court: As I understand the witness, he means that the chamber then was filled up with water instead of having air in it. Is that what you say?

The Witness: There is a little air there with the (Tr. 162:)
amount of water filling that conical chamber, and then they discharge in the chamber below where the screens are.

Q. (By Mr. Freeman:) Now that you have gotten the conical chamber 74 full of water, then you wouldn't suck any more air in because there wouldn't be any space for air?

A. I didn't say that. The obstruction 78, whatever I call it in my patent, the baffle 78, is not closing that conical chamber entirely; it is only interrupting partially the flow, so that the flow is continuing and there will be a little air continually going through the device with the water when this device is operating with open pipes.

Q. Well, can we agree that whatever water and air is within the conical opening 74, that that will be interrupted at least to some degree by the baffles 78?

A. The baffles slow down the flow so that that chamber will be flooded, to effect a higher vacuum.

* * *

(Tr. 186:)

Q. (By Mr. Freeman:) And the difference between the vacuum-producing pump, as shown in Figure 8, is the fact that there is less space when the water passes through the aperture diaphragm and before it enters into the mixing chamber; is that correct?

A. It is not a question of less space; it is a question of being flooded. Otherwise you wouldn't produce a vacuum, because if you had free air around the water, freely circulating, that air would as easily go back in the chamber being evacuated as it would have a tendency to go downstream. Therefore, in order to be able to create the vacuum, so that the chamber being evacuated gets devoid of air, you create in that device called a vacuum pump, (Tr. 187:)

whether it's Felton or my own pump, you have to create a solid portion, which I call a piston effect—call it whatever you like—you have to flood that chamber and create enough pressure to prevent the back-flow of air from the throat into the chamber which is being evacuated, because the chamber that is being evacuated has a terriffic suction toward the outside, or to pull the air back. You know when an electric bulb breaks it makes a lot of noise, because the air rushes in. In other words, the atmospheric pressure wants to go and occupy the space that is emptying, unless there are means provided to stop the return of free air into that chamber; otherwise it is impossible to create a vacuum.

Q. Are you telling us, then, structurewise, that you have to have different proportions?

A. You have to have, structurewise and in mode of operation, different principles in order to make either an aerator or a pump; and when you do have different structure and different mode of operation, then you have different results too, as probably later could be demonstrated and proven.

Q. In Figure 8 of your patent, the patent in suit, you say that is a pump?

A. That is a pump; that is a vacuum-producing device.

Q. And the rest of the devices, the various six or seven different devices, they are what you call aerators?

(Tr. 188:)

A. Exactly.

• • •

(Tr. 196:)

Q. (By Mr. Freeman:) I hand you a copy of Aghnides Patent No. 1,912,113 and I will ask you if that is the water pump that you referred to?

A. Yes, that is one.

• • •

(Tr. 199:)

The Court: That pear-shaped, or onion-shaped, device designated by figure 8, what function does it perform in the pump; what does it do?

The Witness: It prevents the air to go back in the chamber which is being evacuated, because it precisely floods the portion immediately above that onion and prevents the back-flow of air into the

(Tr. 200:)

chamber which is being evacuated by creating a tight, piston effect in that channel and directly above the onion.

The Court: Then, if it were not for the pear-shaped device there, the air would go back into the chamber that was being evacuated?

The Witness: Yes. It wouldn't be a good vacuum pump, wouldn't be effective.

• • •

(Tr. 214:)

The Court: Now, then, demonstrate the difference between the defendant's aerator, Plaintiff's Exhibit No. 19, and your pump, shown on Defendant's Exhibit 15.

The Witness: As the drawing will show, probably will, but we could show here on the sample of defendant's aerator, the water emerges from the space above the onion and below the ring and hits the wall below the lateral orifice on the casing, and that space where the water, from the diaphragm of the defendant strikes the wall is in direct communication with the air ports, and we do not see any water squirting out of those air ports, proving that the chamber where the onion is is not flooded. In other words, the streamlets from the defendant's device strike the wall as naked streamlets, they break against the wall, and that wall is in direct communication with the foregoing lateral air ports.

(Brief recess taken.)

(Tr. 215:)

Q. (By Mr. Freeman:) You said that the air openings in the Aghnides patent, Defendant's Exhibit 15, did not open into the chamber in which the onion was positioned?

A. Yes, there are no air openings, neither above the largest part of the onion nor below the largest part of the onion.

Q. Air does get into the chamber in which the onion is positioned; correct?

The Court: He explained how some came down through those canals up there, through that opening in member 5; he has gone into that part of it.

The Witness: Yes, through the same orifice, some air with water.

• • •

(Tr. 248:)

The Witness: The velocity of the water permits the water to break up; the velocity is the cause effecting the breaking up of the water against the wall so that the water is fragmented as it strikes the wall of the chamber and is broken up into particles, like splashing water in a wave, it is broken up and air in the device surrounding the water—

The Court: How does the air get there?

The Witness: The air gets there through the air vents or air ports 38. You had seen, your Honor, yesterday—

The Court: I am just asking you to tell me how that happens.

The Witness: The air is constantly entering through the air ports 38 the chamber, so the chamber is at all times filled with air surrounding the water flowing into that chamber.

• • •

(Tr. 280:)

Q. (By Mr. Freeman:) The coherency of the water is brought about by the screen?

A. By any means uniting them completely. In this case, if they were not completely united, the screen completes the uniting.

The Court: If the screen were entirely removed here, what would be the result? I mean 28.

Mr. Freeman: That's right; that's what we are talking about, the defendant's structure.

The Witness: Then the stream would not be as coherent as it would be with the screen 28, and it would not be as soft as it would be with the screen 28.

The Court: What about the volume of air in it with the number 28 removed, as compared to the case if 28 remained in it, if you have an opinion about it?

The Witness: The volume of air?

The Court: Yes.

The Witness: If the screen 28 is removed, maybe even more than with the screen on, but that air would readily separate from the stream as the stream is discharged from the device.

(Tr. 281:)

Q. (By Mr. Freenman:) In other words, the screen tends to eliminate or permit some dissipation of the air as the water and air discharges through the lower end of the casing?

A. The screen decreases a little the air drawn through the device, but, in compensation, keeps the air drawn in, whatever the amount, in the stream, it makes it coherent, so that the bubbles in the air-and-water mixtures thoroughly mix, they remain in the stream. The question is not to deliver a stream from which the air separates immediately and the stream itself then does not contain the maximum amount of bubbles. Therefore, by putting the screen 28, whatever the degree of coherence of the mixed air and water by the means 26 and 27, the screen, as I said completes the required resistance in the uniting of

air and water, of the aerated water, into a coherent stream, so that in the issuing streamlet bubbles will stay better in the stream than otherwise.

The Court: Better with the screen in than it would if you would take it out?

The Witness: Yes.

Mr. Freeman: I wonder if I could get that answer read?

The Court: Read the answer.

(The answer to the last question was read by the reporter.)

(Tr. 282:)

Q. (By Mr. Freeman:) In other words, the screen now has some resistance and completes, as you said, the required resistance?

A. It has some resistance, definitely.

Q. Is there any reference to resistance in the second means clause of your claim?

A. You can not make any uniting without any mechanical means, and any mechanical means in the path of the water is resistance; so it had not to be put in the means portion of my claim number 2 that the uniting of the aerated water offers resistance, because it is elementary that any mechanical means in the path of the water offers resistance.

(Tr. 308:)

Q. It is kept from moving inwardly, is it not, by this column of water which is cone-shaped?

A. I am sorry, the column of water is way under where it starts, and we have orifices, airports, in other words, opening into that chamber far away from the red line which indicates the skirt of water. So it just invades the whole space.

Q. And isn't it a fact that the air, when it is sucked in, it is because of a vacuum that is produced as the air is (Tr. 309:)
discharged through the lower end of the device?

A. The air is sucked in because the water broken up imprisons, captures, the air present.

Q. What brings the air from outdoors in through the airport?

A. The velocity of the stream, the velocity of the stream breaking in the chamber where the air is present.

The Court: He asked you what brings the air in.

The Witness: The velocity of a stream breaking in an open space.

• • •

(Tr. 315:)

Mr. Brooks: Your Honor, at this time the plaintiffs tender to the defendant a motion on behalf of the plaintiff, Elie P. Aghnides, to add as a new party plaintiff Chase Brass & Copper Company, Inc., and an accompanying complaint on behalf of Chase Brass & Copper Company, Inc., together with a proposed order, dated January 26, 1955, adding Chase Brass & Copper Company, Inc., as a party plaintiff.

I understand there is no objection on the part of the defendant to the entry of this order and the receipt of these documents.

Mr. Freeman: None whatsoever.

(Tr. 343:)

The trial of the above-entitled matter, having been adjourned on January 28, 1955, was resumed on Monday, October 10, 1955, at 10:00 a. m., before Honorable Johnson J. Hayes, United States Judge, in the court-room of the United States Post Office and Court House Building, Greensboro, North Carolina.

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(Tr. 345:)

Mr. Freeman: If your Honor please, I do want to state in open court that we have abandoned our counterclaim which has to do with the violation of the antitrust laws. We have also abandoned our defense of misuse, so that this case will now proceed as an ordinary patent-infringement case, and the time that we will consume, I am sure, has been materially reduced.

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(Tr. 347:)

ELIE P. AGHNIDES, the plaintiff, being recalled, resumed the stand and testified further as follows:

Cross Examination (Cont'd) by Mr. Freeman:

• • •

(Tr. 357:)

Q. (By Mr. Freeman:) When you say "foraminous member", might that be a screen?

A. No, with the qualification that if the screen—"screen" is a very broad term, because you can have a wire-mesh screen where the holes are very close to each other, as I explained, and read in my patent, or you can have a screen with a few holes in it. So it could be a screen of a particular type, with a certain number of holes, the required number of holes.

Q. Then do I understand that when you say "a foraminous member upstream of the apertured diaphragm", that has to be something other than a screen?

A. Preferably, yes, I meant something other than a screen, I meant something other than a wire-mesh screen.

Q. Now, so that we understand each other, a restricted orifice would likewise not be a screen?

A. It would not be a screen, a wire-mesh screen.

Q. Would a foraminous member be the same as an apertured diaphragm?

A. Could be.

Q. Well, is it or is it not, in your patent?

A. It could be; you can build it so that it would not be.

Q. I am asking you, in your patent, is it or is it not.

A. You are asking me if two words are the same, and I (Tr. 358:)
am saying I don't know to what you are referring regarding the patent. A foraminous member may not be just like an apertured diaphragm, because you could take a ring, a ring that you are wearing, and put in the aperture and that is an apertured diaphragm in a way, but it is not a foraminous member.

Q. Now that is a good example, but let's get back to the subject here at issue. In your patent is an apertured diaphragm and a foraminous member one and the same, or are they different?

A. I said they could be the same or they could be different.

Q. Indefinite, then; your answer is could be or could not be?

A. No, nothing indefinite about it. If you choose to make it not to be the same, you could do so:

Q. Then, turning specifically to your patent, is your patent, wherein you refer to a foraminous member, the same as the apertured diaphragm?

A. Could be.

Q. Well, is it?

A. Well, the Figue 2 shows there the two diaphragms. They seem to be the same, and you may call either of them a foraminous member or you may call it an apertured diaphragm.

Q. Then we have the answer, that in the patent the terms (Tr. 359:)
"foraminous member" and "apertured diaphgram" are one and the same?

A. Could be. In Figure 2 I have shown it to be so.

• • •

(Tr. 374:)

Q. (By Mr. Freeman:) Will you tell me wherein on Plaintiff's Exhibit 37 there is any indication that you can take either diaphragm, as you call them, as corresponding to the term, a apertured diaphragm?

A. Yes, sir; because either of them is an apertured diaphragm, and the illustration will show that either of them can operate as a diaphragm and give a bubbly stream, and you, yourself, said that the openings in the upper one, the serrated disc, of which the openings are much smaller than the openings in the lower diaphragm, and even then I can demonstrate to this Court and show that the lower diaphragm, just the same, can operate to produce an aerated stream.

• • •

(Tr. 378:)

Q. (By Mr. Freeman:) You can agree with me that a

(Tr. 379:)

disclosure corresponding to Figure 6, an identical disclosure of your U. S. patent, is not found in your Belgian patent?

A. Exactly, no, but the teaching is.

Q. (By Mr. Freeman:) So that the disclosure to the United States Patent Office of Figure 6 was made a few days short of three years after the publication of the Belgian patent; correct?

A. The Figure 6?

Q. Yes.

(Tr. 394:)

A. Yes, but the Figure 6, as we said before, the teachings of Figure 6 were in my Belgian patent, so they were in the original U. S. application.

Q. But the disclosure of Figure 6 in the form wherein you have inwardly extending projections, diagonally shooting the water toward those projections, for impingement

of the water against those projections and breaking the water up was first disclosed to the United States Patent Office more than two years after the publication of your Belgian patent?

A. That specific instruction, yes, but as I said before, the teaching was in the original application and it didn't matter whether you directed your stream sideways to strike the surfaces or you directed it vertically to strike the surfaces.

• • •

(Tr. 400:)

Q. (By Mr. Freeman:) And it is likewise true in connection with Figure 5 of the same patent that you told the Patent Office that valuable results could be obtained even if the screen is omitted, but it is advisable to use it; correct?

A: Yes, because I had made aerators in principle the

(Tr. 401:)

same, not exactly the proportions and dimensions contained in this patent, and I had operated without a screen and with a screen.

Q. In both cases they were aerators?

A. They were aerators.

Q. Now you said something about in principle they were the same, just a minute ago. Will you explain what you mean by that phrase?

A. The mode of operation was the same and the stream produced was a bubbly stream, a white, bubbly stream.

Q. Without screens?

A. Without screens.

Q. And I take it that was in connection with Figures 5 and 6, that's where you made your test of physical devices, in connection with figures corresponding to Figures 5 and 6?

A. Yes.

Q. When did you make such test; that is, where the screen 62 of Figure 6 and the screen 54 of Figure 5 were omitted?

A. Oh, I made those tests in the early stage of my invention, 1934 probably, and all those experiments led me to finding that the screen was the less expensive and most efficient form of dividing-means device.

• • •

(Tr. 403:)

Re-direct Examination by Mr. Ely:

Q. Mr. Aghnides, you were questioned by Mr. Freeman about the terminology of some of your claims of the patent, particularly ones where the two diaphragms were described, but he did not call your attention to Figure 4 in the Aghnides patent nor did he call your attention to this chart, Plaintiff's Exhibit 35.

A. Do you mean Figure 4 or Claim 4?

(Tr. 404:)

Q. Did I say Figure 4? I meant claim 4, claim 4 of the patent. Now in that claim—read that claim.

A. Claim 4 of Patent 2,316,832:

> "A device for producing a jet of water containing air bubbles comprising a chamber (C) the inlet end of which is adapted for connection with the discharge end of a faucet or the like and the outlet end of which is adapted to discharge said jet, superposed apertured diaphragms (23, 24) at the upstream end of the chamber through which water is adapted to be forced into the chamber with substantial velocity—"

Q. That's enough. Now on that figure to the right, which is Figure 2 of your patent, how are those two superposed apertured diaphragms marked?

A. Marked by the numerals 23 and 24.

Q. Now come over here to the representation of the Mel-O-Flo aerator and tell us how those are marked again.

A. They are also marked by the numerals 23 and 24.

Q. Now I wish you would mark those two diaphragms with similar coloring as you marked the two diaphragms of Defendant's Exhibit 35, in other words, the upper diaghragm in blue and the lower diaphragm in red.

(Witness marks on drawing.)

Mr. Ely: Now I am going to ask that that reproduction of Plaintiff's Exhibit No. 35 be marked Plaintiff's Exhibit 35-A.

(Tr. 405:)

(Drawing referred to was received in evidence as Plaintiff's Exhibit 35-A.)

Q. (By Mr. Ely:) Now the coloring of those two diaphragms, as applied to the Mel-O-Flo aerator, is the same in Plaintiff's Exhibit 35-A as it is in Defendant's Exhibit 35, is it not?

A. Yes, sir.

* * *

(Tr. 406:)

Q. (By Mr. Ely:) Mr. Aghnides, at various times during your cross-examination, including today, Mr. Freeman has asked you about the lower diaphragm, the one which is marked 24 in Plaintiff's Exhibit 35. Do you have a model which will show that diaphragm?

A. Yes, I do.

Mr. Ely: I am going to ask that this model that I am going to produce be marked Plaintiff's Exhibit 43.

(The model referred to was received in evidence as Plaintiff's Exhibit 43.)

Q. What is this model, Mr. Aghnides; will you show it to the Court and explain what it is?

A. This is a Mel-O-Flo aerator which has at the inlet end a coupling with a restricted orifice. Below that coupling we find a washer, and below that washer we find the two elements inserted one into the other, a ring with an inner element, which is what we have called so far the onion-shaped body. Now in this model I have cut off the part of the onion below the lower end of the ring so as to show that the opening formed with what is left of the cut-off onion and the ring amounts to a very slight open- (Tr. 407:)
ing, which is a diaphragm to produce a stream of water with velocity; and then we can show that this operates substantially in the same way as it did before I cut off the lower part of the onion, especially if I substitute for the cut-off part of the onion, as resistance, an additional screen. The part of the onion which I cut off we call the resistance, one of the resistances inside Mel-O-Flo. Naturally, when I cut it off, the total resistance decreased. Then, to remedy that, I added a second screen to show that this device would operate to produce a bubbly stream.

Q. What is the character of the opening through which the water passes through the lower diaphragm?

A. It's an annular opening. It's very small, so that the water from the faucet will acquire high velocity in order to break up and trap the surrounding air in the mixing chamber.

Q. That opening which you have just shown to the Court, is that the opening which is depicted between the two colored portions of the drawing of the Mel-O-Flo aerator on the left of Plaintiff's Exhibit 36?

A. Yes. Where the onion is still shown, without being blackened, just above the section of the onion we see the annular orifice, and that is the orifice we see here on the actual model of the defendant.

* * *

(Tr. 409:)

Q. (By Mr. Ely:) Now, Mr. Aghnides, I wish you would refer to the passage of the Felten patent which refers to that device as an injector. I think you will find that on page 1, line 25.

A. Yes.

Q. Will you read that, please?

A. (Reading:)

> "The body of the mixing apparatus which of course could also consist of several parts, serves as an injector. It is connected by means of the screw-thread b to the liquid pipe, and the liquid passes through the perforation c, and the gaseous substance, for instance, ozone-air, through a perforation d into the conically widening chamber e, the widening of which produces in a well known manner the suction of the gas from the perforation d owing to the flow of the liquid from the perforation c into the widened chamber e."

Q. That section says that the widening produces in a well known manner the suction of the gas from the perfora-

(Tr. 410:)

tion. Now explain what is meant by suction of the gas from the perforation.

A. It is referring to the mode of operation of water pumps where the velocity of the original stream of water is transformed into pressure, and that falling of velocity and creation of pressure in the chamber, according to Felten, products a suction.

Q. You state that the velocity is transformed into pressure. Just what do you mean by that, Mr. Aghnides?

A. As we see in this exhibit, in Plaintiff's Exhibit No. 45, we have the small orifice on top and below we have a throat or a cylindrical passage, below which we have the widening chamber e. Now the water starts with a high velocity when it enters the device from that orifice on top, and then, as it enters the channel in the conical chamber e, it widens itself so as to fill the conical chamber and the throat and the velocity of the stream naturally falls. We have a very good example of that when we look at the river's flow. At the wide points of the river the water flows very slowly, but when it narrows down we have a very fast flow of water. So here we start with a very fast flow of water and, like the river channel, that channel gradually widens and the water from the orifice on top reaches finally the resistance below throughout its surface, (Tr. 411:)

instead of striking one part and breaking up.

Q. In Felten, does the water strike or impinge against those discs f when the water is in jet form?

A. No, it can not. In the transparent model we have we will demonstrate that.

Q. Quite often, in reference to your devices, you referred to the fact that you had naked jets of water—I think you used the expression "naked jets of water"?

A. Yes, sir.

Q. Do you find, or does the Felten device have within the chamber any naked jets of water?

A. It does not.

Q. Surrounded by air?

A. No.

Q. Now I wish you would refer to your Patent 2,210,846. Is there a reference in there and a distinction made be-

tween your device and injection devices such as in the Felten patent?

A. I remember that there is.

Q. I think if you will look at page 2, column 1, starting at line 35, you will find it.

A. Yes. It says:

> "These effects are apparently due to the extreme thoroughness with which the aeration takes place in my device and the results are quite different from the (Tr. 412:)
> results obtained by ordinary injection devices in which the air is not thoroughly broken up so that when the two fluids leave the apparatus, the air quickly separates from the water jet."

Q. There were you referring to vacuum pumps such as Felten, for example?

A. Yes, to vacuum pumps in general, the injection devices.

Q. Are there any differences—and, if there are any differences, explain what they are—between vacuum pumps and aerators—and for that purpose I think we have a chart here which I am going to ask to be received in evidence as Plaintiff's Exhibit 46.

(The chart referred to was received in evidence as Plaintiff's Exhibit 46.)

Q. Now what differences are there, if any, between a vacuum pump and an aerator?

A. Yes, there is a fundamental difference between these two devices. There is a structural difference; there is also a difference in the mode of operation and function; there is also a great difference in the results.

Q. What devices have you illustrated on that chart, Mr. Aghnides?

A. On this chart, on the left side, we see the cross-section of the Felten device, the Felten pump.

(Tr. 413:)

The Court: That, too, is a pump?

The Witness: Yes, sir.

Q. (By Mr. Ely:) Is that typical of vacuum pumps generally?

A. It is typical of vacuum pumps generally. And on the right side we see my aerator, as illustrated in my Belgian patent, an aerator which is typical of all my aerators.

Q. What is the coloring that you have on there, Mr. Aghnides?

A. I have shown the path of the water by green and the path of the air by red.

Q. Now you said there was a structural difference, or a difference in construction, between a vacuum pump, of which Felten is typical, and an aerator embodying your invention, of which Figure 1 of the Belgian patent is typical. Will you please tell us what the difference in structures is?

A. Well, it will be very clear and easy to see that we do not have the same elements in the two devices. One element which we describe, both Felten and myself, as mixing cha ber, if we draw a line to cut out that portion of these two devices, then we have above that line in the Felten case a whole structure which is designed to create a vacuum, whereas in my device there is no such structure.

Now below, when you compare the so-called mixing chambers of the two devices, we see that in the case of

(Tr. 414:)

Felten the water enters that so-called mixing chamber by

single orifice at the same time as the air. So there is one orifice for the entrance of the two fluids in the mixing chamber of Felten, whereas in my device we have a separate orifice for the entrance of air, shown here by numeral 7, and another entrance or orifice provided for the admission of water into the mixing chamber. Then we don't find, in other words, the same elements in the two devices, because the Felten device has elements there to create a vacuum; the aerator on the right does not have that structure. We can see optically, and also we shall see during the demonstration.

Now we have there the structural differences between the two devices; in other words, the mixing chamber is not the same because we have air entering directly in the chamber, and, above the mixing chamber of each device, there is a portion in Felten which does not exist in my aerator. As a result of this difference in Felten the water enters the device through the vacuum-making portion into the mixing chamber and floods the chamber. So in Felten we don't find one or more naked streams surrounded by air. Contrary to this, in my aerator, we find one or more streams of water surrounded by air, which is due to the fact that in my case the mixing chamber is not flooded (Tr. 415:)

with water because, if it was flooded, first of all, the water would come out of the air vents; second, we wouldn't have those individual streams.

Q. Is there any reason, in the operation of a vacuum pump, why that chamber is flooded with water, as you say; is there any reason or purpose for the flooding of the chamber in the vacuum pump?

A. Yes.

Q. What is it?

A. Without that flooded the vacuum pump would not produce any of the required vacuum. In other words, the

transformation of the high-velocity stream, going through the orifice c, into pressure and flooding of the chamber, forbids or prevents the back-flow of air into the chamber which has been or is being evacuated.

Q. That is to say, this pipe or passage which is marked "d" in Felten, what does that lead to?

A. It leads to some container, containing some gas which is to be exhausted.

Q. What do you say is the function of the flooding of the chamber?

A. The flooding of the chamber is not to allow the back-flow of air into that chamber which is being vacuumized or being evacuated.

(Tr. 416:)

Q. That is to say, were this chamber not flooded, air would find its way back through the open nozzle, back through the channel e, into the chamber being evacuated?

A. Exactly.

Q. What would that do to the functioning of this device as a vacuum pump?

A. It would not be a vacuum pump. If air goes through easily, it can go back very easily. In the case of an aerator there is no vacuum to create, so the air goes through the device very easily, but we don't have to face the shortcoming of that air to go back, because we are not evacuating any chamber. But, in the case of a pump, if the air went down freely and easily in one direction, it would go as easily in another, so the pumps have to provide certain means, have to invent a new device where you can little by little whittle down that vacuum. Time is not such a factor; the idea is to create a vacuum. You can take little by little air so that at no time do you have the danger of the chamber not being flooded.

Q. You say there is no harm in having the chamber e in the Felten device flooded. Now you say the chamber

which is marked 3 in the Belgian patent is not flooded, but has separate streams of water. What is the reason, in your vacuum pump, for not having the chamber flooded? (Tr. 417:)

A. In my aerator, you mean?

Q. What did I say?

A. You said in my vacuum pump.

Q. In your aerator.

A. Because if I flooded the chamber all the water will squirt out through the air vent, number 7, and we won't have streamlets striking the baffles or screens 9 shown in the drawing. If the streamlets can not strike the surface, or screen or baffle, they can not break up into particles and imprison the surrounding air, trap the surrounding air. Felten does not have to have all that; on the contrary, Felten must flood his chamber to create the vacuum.

Q. Then, as indicated by the red and green marks in your aerator, those streams of water, are they surrounded by air?

A. Yes, they are naked streams, surrounded by air.

Q. What about the results of the two devices; is there any difference in the results of the two devices?

A. Yes, the results of the two devices are also radically different. As I was saying before, the pump has to whittle down little by little the air in a container, so the purpose is not to attain a high volume of air, but to attain a vacuum, so there is little air going at any time through the device. (Tr. 418:)

That little air, if it's thoroughly mixed—and it's easier to mix a little air than much air with water—that water will have some bubbles, the stream issuing will have some bubbles, where as in the case of an aerator we have the displacement of a large volume of air, and, due to the fact that the chamber is not flooded, the streamlets strike

the baffles and break up and the whole thing easily and freely goes down and the stream contains many, many more times the proportion of air in the case of my aerator than the Felten. You can not say that this is an aerator because there are a few bubbles. You can not take a glass of aerated water and ten glasses of non-aerated water and mix them and say there are eleven glasses of aerated water. It's not. So here we are facing the same problem. In an aerator the great amount of bubbles bring into intimate contact the water with the air, every particle of water comes into contact with fresh air rapidly flowing through the device. So the aeration is effective and the results are beneficial. In the other case we have some bubbles here and there, but there's not enough of it either be very effective with soap solutions or to improve the quality of the water, and it would be misleading to call the Felten a water aerator, because it would not do the job.

Q. Do these discs in the Felten device, these discs f, have any purpose or function as a part of a vacuum pump? (Tr. 419:)

A. Yes, indeed. I think it would be very hard to flood chamber e in the Felten pump if we took the discs out, and if we didn't flood the chamber e we would find that there isn't much of a vacuum formed, if any. So, even though Felten provided these discs for zigzagging the water and ozone to permeate the water, because he had a chemical operation there and it wasn't a question of a large volume of ozone to go with the water, but a question of sterilizing the water, so that ozone and water stay together as long as possible. So he provided these discs for causing the water to zigzag, but, nevertheless, the function performed by those discs is high resistance, to oblige the streamlet entering through the orifice c to flood the chamber e, because Felten could not get that vacuum with-

out flooding. That also can be demonstrated in this court.

Q. And you said there is no flooding in an aerator?

A. There is not.

Q. What do you have to say with respect to a remark made by the Circuit Court of the Seventh Circuit that, element for element, the Aghnides and Felten devices are the same?

A. Well, I think I have explained at the beginning, first of all, that Felten has a suction-producing section, which is above this line, which we do not find in the aerator. So (Tr. 420:)

there is one element which is not in existence in the Aghnides aerator. Two, when we take the mixing chambers of the two devices below that line, we find elements in one that we do not find in the other; in other words, in Felten's mixing chamber there is one orifice through which your air and water enter that mixing chamber and there is no opening right to the atmosphere that would communicate the outside air with that mixing chamber, whereas in the Aghnides aerator we have independent air vents from the orifices that deliver water in the chamber. So we do not have, element for element, the same thing at all.

Q. Now you have spoken about the proportioning of the resistance to the velocity of the streams entering the chamber in your aerator. Is there any teaching of any such thing in the Felten patent; is there any proportioning of the resistance to obtain the results which you obtain in your aerator?

A. No, I do not find any such teaching.

Q. Now you called attention, I think, to the fact that we had an air inlet into the chamber in your aerator, where there is no such air inlet in the Felten device. What would be the effect if you did put an opening or a passage from the mixing chamber of Felten's vacuum pump to the outside?

A. Well, the Court of Appeals said that it wasn't much (Tr. 421:)
of a job to take an orifice and put it way down—

Q. What orifice are you talking about?

A. An orifice through which the ozone enters in Felten.

Q. That is orifice d?

A. Orifice d—and the transparent model—

Q. Show the Court what you are talking about.

A. The demonstration of this transparent model, where an orifice has been bored below the one normally shown, will indicate that if, in Felten, you open the side wall so that the outside air would communicate with the mixing chamber, the water will squirt out and there will be no air in the stream; the little air that Felten entrains, if we put that orifice way down and substantially above his discs f, we shall see that the water will squirt out of that hole of the lower orifice and that not only water will squirt out instead of air getting in, but we shall also see that the stream resulting, the Felten stream, which has so little air, will have none, indicating that it can not be done.

Q. Indicating that there is a substantial difference?

A. That you can not in a pump lower the orifice for the introduction of air without ruining the pump.

Q. Now the Court of Appeals of the Seventh Circuit said that the two devices, that is, the Felten vacuum pump and your aerator, accomplished the same results, though (Tr. 422:)
perhaps not with equal efficiency. What have you got to say to that, Mr. Aghnides?

Mr. Freeman: Are you asking that as a patent expert, or just his opinion of what the Court of Appeals in the Seventh Circuit said?

Mr. Ely: I am asking him what he has to say as to whether the two devices accomplish the same result, though perhaps not with equal efficiency.

The Court: I will let him go ahead and comment on his view of his device and Felten's, as connected with what was said by the Circuit Court, but, of course, I am not going to let him pass on the law as interpreted by the Court of Appeals of the Seventh Circuit—just what he has to say with reference to these two devices.

A. The results are totally different because—and we can prove it in this court—because the Felten device entrains so little air, and the aerator entrains not only one, twenty, fifty or a hundred per cent more, but hundreds of per cent more. So it's not a question of more or less. You have a new principle, too, which is such a radical difference from the results given by the Felten. We know that, as I have given the example before, the ordinary propeller airplane could go up to three hundred miles; to make it go over six hundred they had to invent the jet (Tr. 423:)
plane. Here we don't make it from three hundred to six, but make it from three hundred to twelve hundred, four times more, so it has to be different, as we shall see during the performance of this demonstration; that, due to the difference in mode of operation and in structure, the results are also radically different.

Q. All right, Mr. Aghnides, I want to go on to something else now. I want you to look at your own vacuum pump, Patent 1,912,113, which was Defendant's Exhibit 15, and I want you to make some comments on that. Incidentally, we have a model of that, Aghnides vacuum pump, which I am going to offer in evidence as our next Exhibit, Exhibit 47.

(The model referred to was received in evidence as Plaintiff's Exhibit 47.)

Mr. Freeman: I wonder if you would identify that, rather than offering it. I am not acquiescing in the offer until I have an opportunity to determine whether or not it is a fair representation of what you say is in the Aghnides patent.

The Court: He can offer it, and, if it's not, we can strike it out.

Q. (By Mr. Ely:) Mr. Aghnides, can you say whether that Exhibit 47 does follow the structure of the Aghnides vacuum pump patent, Patent 1,912,113? (Tr. 424:)

A. Yes, it does.

Q. Now I would like you to refer to some passages and make some comments there as seem pertinent. I want you to refer first to the paragraph beginning in line 5, column 5, page 1 of the patent, "One object," and so forth.

A. (Reading:)

> "One object of the invention is to do away with the very long or long outlet tube that it was always necessary to provide to prevent the inrushing back of air into the vacuumized vessel."

Q. What are you talking about there, Mr. Aghnides? Explain that a little more.

A. Yes. Vacuum pumps have a problem. In order to prevent the inrushing, the downward moving of the air, they have to be really effective, because the purpose is to create a high degree of vacuum—and those water pumps used in laboratories had a long stem and, in addition to that long stem, they used to attach a tube to make it even longer, so that the flooded chamber would be as long as possible and the piston effect would be as effective as possible, to prevent the back-flow of air into the chamber to be evacuated.

Q. Is that what you mean by flooding; the piston effect and flooding, are they synonymous?

A. Yes; in other words, the flooding creates the piston effect.

(Tr. 425:)

Q. And the purpose of the piston effect, as I understand it, is to prevent the return of any air into the chamber or whatever is being evacuated?

A. Yes, that's right.

Q. And that is what you are talking about here when you say "to prevent the inrushing of air back into the vacuumized vessel"?

A. Yes; but there is no such problem with an aerator.

Q. I want you to call the Court's attention to that portion of the patent beginning with line 25, page 1, column 1.

A. Yes. It says:

> "One realized in that manner a particular path for the liquid, path which is characterized in that it is curved without breaking or fragmenting the flow of the liquid."

Q. What do you mean by fragmenting; breaking up the liquid?

A. Yes, sir; while, in an aerator, the more we fragment and the more we break up, the better results we have. In a vacuum pump, the stream produced would be so soft, so vulnerable, the air from outside would go right into the chamber being evacuated. That is why, in this pump of mine, that onion-shaped body 8 is in the center, so that the water going down through the conical channel 7, without breaking, without fragmenting itself, can surround the onion and go down.

(Tr. 426:)

Q. With the result that you create a vaccum pump in a much shorter space?

A. Yes, sir; and that onion-shaped body 8 permitting also the flooding of the conical chambers.

Q. Does it also create the flooding; does it assist in creating the flooding?

A. Greatly, of course.

Q. So that in the body of your vacuum pump shown in this patent there was no breaking up of the water in the interior of the chamber?

A. It operated like the usual water pumps.

Q. Whereas, in the body of your aerator, such as shown on the chart, the water is broken up?

A. The water is broken up, surrounded by air and—

Mr. Freeman: I don't object to the leading question, except that we ought to identify the chart so we will know later on which one we are talking about.

Mr. Ely: I think you are right. The chart, Plaintiff's Exhibit 16, is the one we are talking about.

• • •

(Tr. 427:)

Q. (By Mr. Ely:) Mr. Aghnides, the first thing I want you to do is to take the model, Plaintiff's Exhibit 43, that is, the Mel-O-Flo with the bulb or onion cut away, and mount it so that you can show the Court what kind of a stream is projected by the lower diaphragm. Tell me what you are doing first.

A. I am taking out of the Mel-O-Flo the ring, which, in combination with the central body, forms the two dia-

(Tr. 428:)

phragms, and I am putting it in a cutaway body so that

we can see in which form the streamlets emerge from the annular orifice of the lower diaphragm. I am attaching it to the central faucet and we shall turn the water on at the same pressure on the gauge there as we had demonstrated before, that is, 30 pounds. Will you turn the water on? (Demonstrating.)

Q. Now shut the machine down so that you can be heard.

A. We have seen—and we shall open the faucet again to see it again, so that in the meantime I can explain what we have seen—we have seen the water conically emerging from the lower diaphragm and that water was broken up into streamlets, due to the fact that the serrated diaphragm above the lower diaphragm has little openings through which the water went, went downward and came out of the annular orifice with all the impact of the diaphragm on top, the second diaphragm. Now, if we turn the water on, with a flashlight we can look closely and we can see that the stream coming is not a continuous skirt, but it is all divided into streamlets (demonstrating).

Q. Now the next thing I want you to do, Mr. Aghnides, is to put that mutilated device with the bulb cut off, put it in the regular casing of the Mel-O-Flo and let's see what happens. Now when you have cut away the lower (Tr. 429:)
part of the bulb what have you done to the resistance in the regular Mel-O-Flo?

A. Well, I take away a part of the total resistance so that the resistance is less now, and the jet is not as thoroughly done, as the stream issuing will show (demonstrating). So we have seen a white stream of water, not too even, which was due to the streamlets we have seen issuing when you operated the two diaphragms without the main body. Now if we put an additional screen to what there

is already, then we shall compensate in a practical way for the cutting off part of the onion and the stream will be a little better.

Q. In other words, you are going to replace the resistance which you took away when you cut off the lower part of the onion, you are going to replace that with a resistance set up by an additional screen; is that right?

A. Yes, substantially, in an easy way. It is not accurate and total replacement.

Mr. Freeman: I could save some time if I could ask him whether that screen is placed right on the other screen, or is there a spacer in between, a relative positioning of one with the other. Otherwise I am going to have to ask that these demonstrations be done over.

The Court: I will let you ask him now.

The Witness: Well, sir, your screen has to be (Tr. 430:)

kept in position by one ring. That ring seems to be a sixteenth of an inch high, I don't know exactly. I am going to put my screen on top so that they will be slightly spaced. We can push it down so they will touch each other, but in this case it will be immaterial because we are just going to prove a principle and total perfection in a temporary demonstration is not possible, because we have got half an onion and we are putting a screen. Even then we shall see that the ultimate stream will be somewhat evened up (demonstrates).

Q. Now cut off the machine and tell us what happened.

A. We had a rather nice stream which was soft and full of bubbles, as the glass test showed and as the jar we put in the stream was covered with a non-splash, bubbly stream.

Mr. Ely: I suppose I should mark this as Plaintiff's Exhibit 43-A, with the added screen. I only had 43 without the added screen. I will make this 43-A with the added screen.

(The model referred to was received in evidence as Plaintiff's Exhibit 43-A.)

Q. Now let's take the standard Mel-O-Flo, with the ring and disc and onion all in place, take those parts out, put them in your holding ring, and run the tank so we can see the character of the streamlets as created by the standard Mel-O-Flo ring and diaphragm.

(Tr. 431:)

The Court: What exhibit?

Mr. Ely: This is Exhibit 19.

A. Here I have the Mel-O-Flo and I shall take out the ring and the element placed into that ring and locate those two elements in the cutaway ring and attach it to the faucet to see the nature of the streamlets issuing from the lower diaphragm (demonstrates). One can see very well the individual streamlets issuing from the lower diaphragm in a skirt-like stream.

Q. There is a large center stream, in addition to the—

A. Well, that center stream is due, according to my own understanding, to the fact that some of the water follows the round shaped onion and goes down to the lower center of the onion and projects itself in a more substantial form of a stream.

Q. But the water, as it is issuing from the lower diaphragm, is in what form, as shown in this demonstration?

A. Well, they are atomized, they are divided into fine streamlets; in other words, the character of the stream-

lets issuing from the upper diaphragm is found in the ultimate issuing streamlets.

Q. Now, Mr. Aghnides, you will recall that during your cross-examination at the session in January you made the statement, I think, to Mr. Freeman that the space between (Tr. 432:)
the two diaphragms was filled with water and, as I recall it, he expressed some doubt about the subject. Do you have a model here which will demonstrate whether your testimony was correct or not?

A. I do.

Mr. Ely: Before we do that, I am going to mark that holding ring as Plaintiff's Exhibit 48.

(The ring referred to was received in evidence as Plaintiff's Exhibit 48.)

Q. Now what are you going to produce, Mr. Aghnides?

Mr. Freeman: Could I ask one question?

Mr. Ely: Yes, sir.

Mr. Freeman: The one you have just demonstrated had to do with the upper and lower diaphragms; correct?

Mr. Ely: Yes, we had your complete insides.

Mr. Freeman: In connection with the upper and lower diaphragms, or the superimposed diaphragms of the patent in suit, the first one only has one diaphragm?

Mr. Ely: I think we all understand that.

Mr. Freeman: So, as I understand it, the demonstration you have made with those two diaphragms and cutaway model has to do with the second patent in suit?

Mr. Ely: No; has to do with the first patent, where it says the stream of water issues with sub-
(Tr. 433:)
stantial velocity from the diaphragm into the chamber.

Mr. Freeman: Whether through the two diaphragms or the one?

Mr. Ely: Yes; as far as infringement is concerned, the upper diaphragm in your device answers to the diaphragm in the first patent.

* * *

(Tr. 434:)

Mr. Ely: He will do it when we get through here. I have forgotten where I was, but I asked him if he had some means of demonstrating whether the space between the two diaphragms in the Mel-O-Flo aerator was flooded. He said he did and produced this device.

(Tr. 435:)

Q. (By Mr. Ely:) Tell what it is, Mr. Aghnides.

A. This device is a Mel-O-Flo, in other words, the inner parts, the ring and the elements placed in the ring. This Mel-O-Flo was purchased in New York. We have made a hole from the bottom of the onion upward so that we would reach the space between the onion and the upper serrated part, so that when this element is placed in the ring we have the regular elements of the Melard ring and onion, but equipped with a pipe in the center of the onion leading into the space between the onion and the serrated disc, to prove to this Court that that chamber there is full of water.

Q. You said "that chamber there."

A. Between the two diaphragms, is full of water.

Q. All right, put it on.

A. (Demonstrating.) Then we see water squirting out of that pipe leading into the space between the two diaphragms.

Q. What does that prove, Mr. Aghnides?

A. That proves that that space between the two diaphragms is full of water, and that pipe reaches the center of that space, so that it would not be too near to the serrated orifice. In other words, under the worst conditions for our purpose, it still shows that that chamber is flooded.

* * *

(Tr. 437:)

Q. (By Mr. Ely:) Mr. Aghnides, do you have a way of demonstrating a Mel-O-Flo aerator with a lower diaphragm only?

A. Yes.

Mr. Ely: I don't know whether I introduced that model with the gooseneck.

The Court: I don't think you did.

Mr. Ely: I am going to ask that it be received as Plaintiff's Exhibit 49.

Q. (By Mr. Ely:) Now will you demonstrate the Mel-O-Flo with the lower diaphragm only? Tell us what you have there, Mr. Aghnides.

A. I have there, I am holding, the inner ring of the Mel-O-Flo with the center piece which has the onion in the serrated part, only I have cut away from the serrated part enough so that the lower part would operate only as the lower diaphragm. So this is to prove that the annular orifice below, formed by the onion and the ring, operates as a diaphragm, because we will not have this time the cooperation or existence of the upper diaphragm, having

cut off a major part of it. I am going to put this unit into the cutaway ring and fit it on the tap. (Demonstrates model.)

(Tr. 438:)

Mr. Freeman: Are those individual jets coming out now?

The Witness: Many of them.

Mr. Freeman: Are they formed by the lower ring, which is the continuous annulus open, or are they formed by the four pieces you cut away from the upper diaphragm, the serrated diaphragm?

The Witness: If you will observe, you will see that where the four legs are we have streams going in a more divergent way from the other streams which are in between, formed completely by the annular space.

Q. (By Mr. Ely:) Why do you have those four legs on there, Mr. Aghnides?

A. Simply to hold it in position, because it would not stay in the ring if I had cut off completely the serrated part.

Mr. Freeman: Can I ask you to drop the upper diaphragm having the serrated edges and the onion and ring in the normal casing of the kind used by Mel-O-Flo and then demonstrate it?

The Witness: Demonstrate this with the Mel-O-Flo aerator?

Mr. Freeman: Yes, with the screen below.

Mr. Ely: That is what I was going to do next. Go ahead.

The Witness: Now I shall put this element we

(Tr. 439:)

have just demonstrated in the normal body and

demonstrate to show that the lower diaphragm by itself produces a stream of water, or streamlets of water—it doesn't matter—and breaks on the resistance which is in its path, which is the onion and wall and screen, to give aerated water. Of course, I must add that this will not be a perfect stream, because the proportioning of resistance by Melard structures was not made to operate with that lower diaphragm alone, but it will show, nevertheless, that that diaphragm alone has a sufficiently small orifice to produce streamlets of high velocity, able to draw in air and give a bubbly stream. (Demonstrates model.) We saw the white stream, with air, rather harsh, simply because the resistance has not been proportioned to give the best results in this construction. I may note that we have seen that that annular orifice is plenty strong to give high velocity and draw in a tremendous amount of air.

Mr. Ely: I am going to ask that that latest model we have tested be marked Plaintiff's Exhibit No. 50.

(The model referred to was received in evidence as Plaintiff's Exhibit 50.)

• • •

(Tr. 448:)

Mr. Ely: I wanted to summarize this last series of tests made at the behest of Mr. Freeman.

Q. (By Mr. Ely:) That is to say, you started out with the regular screen at the end of the Mel-O-Flo aerator, then put one more screen, making two, and then another one, making three; so you had three screens finally?

A. That's right.

Q. Was there any progressive improvement in the character of the stream as you added each of those successive screens?

A. Definitely.

Q. You wound up with what?

A. We wound up with a regular aerated, bubbly stream.

Q. Then you had a device in which you had an upper diaphragm, did you not?

A. Yes, sir.

Q. Delivering streamlets of water under pressure and (Tr. 449:)
at substantial velocity into a chamber—did you not?

A. I did.

Q. And you had then streamlets striking the resistance, did you not?

A. Yes, sir.

Q. What was that resistance, what form did that resistance take?

A. It was in the form of a screen.

Q. A screen or screens?

A. A screen at first, and then we added the second and the third screens.

Q. What you were doing, then, when you added each successive screen, you were proportioning the resistance to the velocity of the streamlets as they issued from the upstream diaphragm; is that correct?

A. Exactly.

Mr. Ely: I am going to offer that device with the three screens in evidence as Plaintiff's Exhibit 52.

* * *

(Tr. 450:)

Q. (By Mr. Ely:) Mr. Aghnides, there was considerable discussing during your cross-examination by Mr. Freeman as to the purpose of a restricted outlet as an element for forming a coherent stream. You remember that part of your cross-examination, do you?

A. Very well indeed.

Q. Do you have any model which you can demonstrate which shows whether or not it is necessary to have a restricted orifice, restricted outlet, in order to have a coherent, bubbly stream created by an aerator of your invention?

A. Yes, sir, I have here an aerator made according to the teaching of my Figure 1 of my Belgian patent, in which there is no constricted orifice below the resistance means; in other words, after the screen there is no restriction or constriction of the orifice. The inside of the device is of the same diameter.

* * *

(Tr. 452:)

The Court: The body, at the place where the screens are inserted at the lower end, is virtually the same as it is above the point where it is restricted?

The Witness: The same as it is above the screens.

* * *

(Tr. 453:)

The Court: The only reason I asked you any questions was to find out if the example that you use is shaped like it is drawn in Figure 1 of Plaintiff's Exhibit 46.

The Witness: It is, exactly.

The Court: That is all I wanted to know. Put it together and we will see it operate.

Mr. Ely: Let's mark that Plaintiff's Exhibit 53.

(The model referred to was received in evidence as Plaintiff's Exhibit 53.)

The Witness: This is the coupling to attach to the aerator and then to the faucet. (Demonstrates model on faucet, with water turned on. Here we have a bubbly stream without any restricted orifice,

and it shows that when you put the jar below it envelopes it with bubbles.

* * *

(Tr. 457:)

Q. (By Mr. Ely:) Mr. Aghnides, do you have any means of determining the degree of vacuum that vacuum pumps create?

A. Yes, here we have a gauge showing thirty degrees, which is total vacuum.

Q. Thirty inches?

A. Thirty inches of mercury, which means total vacuum at sea level. It is very difficult, if not impossible, to create complete vacuum, so all the vacuum-creating devices come very near to it but do not obtain the perfect vacuum. That has been one of the big scientific problems, a perfect vacuum. We shall see now that the Felten device and my own pump create seventy to eighty-five percent vacuum, depending on the vacuum pump operating.

Q. Now will you first take the Felten model, Plaintiff's Exhibit 54, and demonstrate the way in which it performs?

A. I am fastening now the Felten pump, made out of transparent material, on the central faucet, to the faucet in the center. Now I am connecting the lateral tube on

(Tr. 458:)

Felten's pump with the vacuum gauge to see the degree of vacuum it is able to create. (Demonstrates model on faucet.) We have there twenty-five inches of mercury.

Q. And what was the character of the stream that was issuing from the vacuum pump?

A. There was no air in the stream.

Q. And that is the way in which the device is intended to operate, to be connected to some vessel to be evacuated?

A. That's right; that is why that lateral pipe is provided.

Q. Now will you take your own vacuum pump, Plaintiff's

Exhibit 47, and will you demonstrate the manner in which that operates?

A. Yes. (Demonstrates model on faucet.) Now we are operating my own vacuum pump under the same pressure and the gauge shows that it creates a vacuum of twenty-five inches of mercury, and the water has no bubbles, has no air in it.

Q. Now, Mr. Aghnides, are you prepared to make somewhat similar tests with the Spring-Flo and the Mel-O-Flo aerators?

A. Yes.

Q. Please tell us first about the Spring-Flo aerator.

A. Well, the Spring-Flo aerator is not a vacuum-producing device. The Spring-Flo entrains a large volume of air, much larger than the vacuum pumps, and yet it creates very little vacuum, if any. We shall see that it will (Tr. 459:)
create about one inch of mercury against the twenty-five inches we have seen with the pumps.

Q. How do you propose to do that, Mr. Aghnides?

A. Well, I take a regular Spring-Flo and put a channel around it and a lateral pipe, to be able to connect it to the vacuum gauge. Now I am showing the inside of the Spring-Flo, which is a regular production Spring-Flo, the main body, the slots connecting with the channel and the pipe thereon. Then we have the two screens which go into the main body. On top of the screens we have the perforated disc in the shape of a cup; and then we have the second diaphragm, which is the second patent, with a washer around; and this is the Spring-Flo of commercial production.

Q. That is the one that is made by Chase Brass, is it?

A. That's right. To permit better sealing on top, I am putting a washer. Now I am attaching this aerator to the faucet in the center and I shall run it first to show to the Court that it operates normally, under its normal condi-

tions, when the lateral pipe is not connected to the vacuum gauge. (Demonstrates model on faucet.) Here we have the usual bubbly stream given by Spring-Flo.

Now I shall connect this device with the vacuum gauge. Here I have a coupling, one end of which is large enough (Tr. 460:)

to engage into the pipe attached to the Spring-Flo and the other end to engage into the pipe leading to the gauge. Now will you turn the water on (demonstrates)?

Here we see that the vacuum created is above an inch. The stream has no air incorporated and we have very small vacuum, which, in practice, amounts to lifting the water a foot to foot and a half high, whereas in the case of vacuum pumps it amounts to lifting the water twenty-five to thirty feet high, which is a considerable amount of work, and that work, of course, energy is coming from the water pressure, which means that the pumps waste that energy, or utilize it for creating vacuum, whereas in the case of aerators we see there is no vacuum produced on a practical scale and that all the energy is made available for the areation of water.

Mr. Ely: I want to offer the Spring-Flo aerator with the collar as the plaintiff's next exhibit, and I have lost sight of the exhibit numbers.

(The model referred to was received in evidence as Plaintiff's Exhibit 54.)

* * *

(Tr. 468:)

Q. (By Mr. Ely:) Now I guess we are ready for the Mel-O-Flo, and we are going to make the same test as with the Spring-Flo. Take that apart and tell us what you have.

A. Here we have the commercial Mel-O-Flo aerator which has been equipped, as in the previous case, with a collar and with a lateral pipe which permits the connection of the

vacuum gauge, and we have the inner parts. First we have the complete Mel-O-Flo aerator—

Mr. Freeman: Which patent is this to demonstrate?

The Witness: The two patents. (Demonstrates with model on faucet.) We have now the Mel-O-Flo operating with air-admission orifice open, so that we have a soft, bubbly jet.

Q. (By Mr. Ely:) Now what are you doing?

A. Now I am connecting the Mel-O-Flo with the vacuum gauge.

Q. Through that adaptor?

A. Through that adaptor, for that same reason as I explained before, because the pipe is too small. (Demonstrates with model on faucet.) Here we have hardly any vacuum created.

Q. What did the gauge show?

(Tr. 469:)

A. The gauge didn't show anything to me.

Q. Why did you run your hand over it?

A. To perfect the sealing, so that there will be no air entering the aerator from other parts.

Q. Let's take that off—

Mr. Freeman: Give him a chance to run it now with the same test as you made with the other device.

Mr. Ely: I will introduce it as Plaintiff's Exhibit No. 55.

(The model referred to was received in evidence as Plaintiff's Exhibit 55.)

Mr. Freeman: Will you run the device now with the tube leading to the adaptor of the vacuum gauge being removed?

(Witness demonstrates as requested.)

Mr. Freeman: Now will you take the adaptor off?

(Witness demonstrates as requested.)

Mr. Freeman: Would you take your scale that you had and seal about half of the opening that now extends out from the device?

(Witness demonstrates as requested.)

Mr. Freeman: Does that make any difference?

The Witness: I don't see any difference.

Mr. Freeman: Will you seal off about three-quarters, by your naked eye?

(Tr. 470:)

(Witness demonstrates as requested.)

Mr. Freeman: Does it make any difference?

The Witness: I don't see any difference.

Mr. Freeman: Will you seal off a little more?

(Witness demonstrates as requested.)

Mr. Freeman: Does it make any difference?

The Witness: I don't see any substantial difference.

Mr. Freeman: Will you seal off just a little more, Mr. Aghnides, please.

(Witness demonstrates as requested.)

Mr. Freeman: Does it make any difference that you can see?

The Witness: I don't see any substantial difference.

Mr. Freeman: That's all.

The Court: Close it up and let's see what it will do.

The Witness: (Demonstrating as requested.) Now it makes a difference.

Q. (By Mr. Ely:) Just for the sake of the record, what was it you did in response to Mr. Freeman's request and what were your observations?

A. Well, Mr. Freeman wanted to see, if we decreased the air orifice little by little—

Q. What air orifice?

* * *

(Tr. 471:)

Mr. Freeman: I noticed that you didn't run the Felten model by itself, without the vacuum-testing rig attached to it.

Mr. Hamilton: We are just getting to that.

Q. (By Mr. Ely:) Now, Mr. Aghnides, will you please put the Felten model, Plaintiff's Exhibit 44, on the tank and operate it and show to the Court the character and volume of the stream produced. In this case I want the opening which is normally connected to a chamber to be evacuated to be open to the atmosphere and I want the pin which is halfway down the device left in place.

A. Now we have the Felten pump without the lateral pipe being closed; it's open to the atmosphere, which wasn't intended to be, but we are going to operate it so that, instead of ozone and air, air alone, atmospheric air alone, will go through:

(Tr. 472:)

Q. That is, there is a free admission of air from the atmosphere into the interior of the device; is that correct?

A. That's right. (Demonstrates with model on faucet.)

Q. Tell us the character of the stream.

A. We have a stream which contains some air. I shall give the glass test. When the glass is filled it doesn't empty itself out rapidly, showing that there is very little air in the Felten stream.

Then we shall test now with the jar, and we shall see that the Felten stream does not splash and it does have some bubbles.

Now I should like to show that if we have an ordinary stream of water flowing in such small quantity it will not splash either. (Demonstrating with stream from faucet on jar.)

Q. What is it you are doing now?

A. In other words, I am showing here to the Court that the splashing of the water becomes a problem when you have a big volume of water coming out, in other words, when you have water coming under high pressure. Here in the case of Felten we have seen when we filled the glass, which took a few seconds, there is very little water flowing, so the non-splash nature of it is a granted matter.

Q. What did your glass test show with respect to the (Tr. 473:)
amount of air?

A. Well, the glass test showed that there was very little air in the stream.

Q. Now I want you to turn that on again. I want you to point out to the Court again what the condition on the inside of that conical chamber is with respect to the amount of water and so forth.

A. Now the purpose for making this pump transparent is to show what is going on inside, in other words, the mode of operation of a water pump. We can see clearly that the throat, as well as the widening conical chamber, both are full of water. According to Felten, this construction of this pipe and the widening part—

Q. "This pipe"—will you say what you mean by "this pipe"?

A. The throat under the orifice and the widening part below are responsible for the creation of a vacuum, the vacuum that we have seen a while ago that attained

twenty-five inches of mercury. That construction just referred to does not exist in the aerator. If it did the aerator would squirt water out on the sides.

Q. Now, Mr. Aghnides, did you observe in there any individual streamlets going down through the chamber in the lower part?

(Tr. 474:)

A. I was coming to that. We have seen, and we shall again, that the stream of high velocity, flowing from the upper orifice, floods the lower part, the throat and the channel. In other words, that single jet coming out of the orifice never reaches the baskets, because of the space which is over a third of the total height of the device from the baskets, all that space is filled with water and some air, so that that streamlet of high velocity created from the orifice of the Felten pump is unable to reach the basket, strike it and break itself into fragments, because that streamlet of high velocity flows in a filled-up chamber and it is unable to reach. Therefore it is known in physics that the velocity of a stream is inversely proportional to the opening. A practical illustration of that we have in a river. When the river is wide the water is flowing slowly, and at the parts it's very narrow it goes fast. Here the very narrow part becomes very wide and the whole thing is flooded. In other words, as the water strikes the basket it has hardly any velocity and there is no breaking up; there is no stream surrounded by free air, there is no naked stream.

Now if in a pump we didn't have that condition—I think we can demonstrate also the point I am going to say—If we destroyed the condition of flooding, even though we

(Tr. 475:)

would have the condition there, we would not have any vacuum created. So it is very important for a pump that

velocity is transformed into pressure to create the piston effect to prevent the back-flow of air and create a vacuum.

Q. Now, Mr. Aghnides, do you have any visual way of demonstrating the flooding of that chamber, that widening conical chamber in the Felten vacuum pump?

A. We have seen it flooded visually. Now if we close the lateral orifice we shall see again it is filled with water. Whether the lateral orifice now admitting under these conditions air is open or closed, that conical chamber in Felten is always flooded with water.

Q. Now I want you to do that; I want you to hold your finger over the end of the pipe d in the Felten pump; I want you to start the device, and then I want you to remove the side plug which is part way down the device and see what happens.

A. (Demonstrating as requested.) Now we have a stream of water containing no air at all, because the air vent or the lateral pipe has been closed. Now I am going to show that if that lateral pipe was in a lower position than it is now, instead of getting any air in, water will squirt out. (Witness demonstrates.) Then the entire function of the pump has been destroyed by putting that lateral orifice at the lower position. Then we saw that (Tr. 476:)

there was no air in the water, which would mean there would be no vacuum creation, and we also saw what is impractical, the water squirting out of that lower orifice.

Q. What about what the Court of Appeals said, that if in practice it is proved desirable—that lower placement, speaking of the lower placement of the air inlet—it does not amount to invention. What does this demonstration show with respect to that?

Mr. Freeman: That happens to be a matter of law. I don't object to him making any demonstration he wants to make.

The Court: I will let him describe what happened. Go along. I will give you an exception.

A. Well, we have seen here that, because of the inner construction of the water pump, the Felten water pump, we can not indiscriminately select the position of the air vents—

Q. The air inlets, you mean?

A. The air inlets—between the so-called resistance and the orifice delivering the stream of high velocity. It has got to be where it is, because, if you lower it, we have seen what will happen. The pump will be no more a pump; the pump will not become an aerator, and the whole thing has been destroyed and has become useless; whereas, in the case of an aerator, the orifice letting air into the cham-
(Tr. 477:)
ber can be anywhere, simply because the aerator does not have that vacuum-producing portion, that flooded portion.

Q. You did, I think, demonstrate at our previous hearing one of your aerators with the portions cut away—do you recall that? That was Plaintiff's Exhibit 39, a Velva-Flo aerator.

A. Yes.

Mr. Ely: I wonder, Mr. Hamilton, if you will produce that and we will make a comparative test right now.

Q. Now, on Plaintiff's Exhibit 39, is the side wall of the aerator cut away?

A. Yes, it is.

Q. Now it is cut away, and the conditions are somewhat similar to the conditions when you removed the pin from the side of the Felten vacuum pump?

A. Yes, sir; it is even more so, because here we have practically no wall at all between the resistance and the

screens in the upper diaphragm; it's open all around. It also is very important to notice that when construed that, element for element, it is the same thing, we can see that there is no element except the open atmosphere between the screens and the diaphragm, whereas here, between the baskets and the orifice in Felten, we have different elements which Felten himself describes as being resistance (Tr. 478:)

for the vacuum creation. (Witness demonstrates with Exhibit 39 on faucet.)

Now one can see clearly the streamlets, individual streamlets, delivered by the diaphragm in the aerator with the side completely open, each streamlet being surrounded by fresh atmospheric air, and the delivery of a highly aerated stream without any flooding in the aerator chamber, because, if there was such a flooding, the water would come out from that cutaway portion. We have already demonstrated that if we increased the resistance we could create a flooding.

Q. In other words, comparing the two devices, that is, your own aerator and the Felten vacuum pump, will you say what is the condition of the water as it is flowing through the chamber in your aerator?

A. Yes, we can see with naked eyes the mode of operation in the two devices. We can see that in one case the inside is flooded, in the case of the Felten pump, between the resistance and the diaphragm, whereas in the case of the aerator it is not flooded and we have a perfect aeration.

The Court: It's open all the way except for the two sides there that hold it up?

The Witness: Yes.

Q. (By Mr. Ely:) Whereas, if you open the side-wall of the Felten pump, water flows out, does it not?

(Tr. 479:)

A. As we have seen in this a while ago.

Mr. Freeman: Can I ask if it would make any difference if you had a plurality of openings all around the Felten device when you started it up?

The Witness: Water would come out through the plurality of those openings.

The Court: What keeps that water from going out of those openings there?

The Witness: Because, according to the teaching of the patent, the resistance below the diaphragm delivering those streamlets we have seen is smaller than the velocity of the streamlets, so the whole thing breaks and goes down. If your Honor remembers, last January we demonstrated that if we added more screens than we have now—I think we had to add three more screens with the regular Velva-Flo to flood it immediately. So this being built according to the teaching of the patent, there is a proportioning of the resistance, of the means of breaking up, with the stream velocity coming out of the diaphragm.

Q. Now, Mr. Aghnides, I want you to run the Felten vacuum pump and want you to call his Honor's attention to the condition of affairs in the throat, by which I mean the portion leading from the inlet end that's attached to the

(Tr. 480:)

chamber to be evacuated to where the chamber starts to widen. I want you to put your finger over the end of pipe d in the patent, run the device, and call the Court's attention to the character of the water in the throat and then in the body.

A. (Demonstrating as requested.) One can see now that there is no air in the stream and the water in that portion

which we call the throat is slightly whitish, due to the high degree of vacuum created, some vapor being created, and we see the conical chamber, as well as the throat, completely filled with water.

Q. Now there is one thing I want you to do, Mr. Aghnides; I want you to remove the baskets from the lower end of the Felten pump.

A. I think it has been stated by me over and over again, this question of flooding being essential to create the vacuum and that these baskets offer the resistance, like the onion in my own water pump offers the resistance necessary to flood the inside of the pump. Now I am going to prove that if that inside is not flooded we don't have vacuum. To do that I am going to take those baskets out.

Q. You have taken the baskets out and put the nozzle back on?

A. The nozzle back. (Witness demonstrates with model on faucet.)

(Tr. 481:)

Q. Now what is the condition of affairs?

A. Well, we see now that jet of high velocity in Felten goes right through, widening somehow, and there is no flooded chamber inside, and we are going to see now that if we connect this device with the vacuum gauge we will not have much of a vacuum, if any.

Q. Now what are you doing?

A. Now I am attaching this vacuum pump of Felten, without the baskets, otherwise identical, to the vacuum gauge. (Demonstrates model on faucet.)

Q. Now tell me just what you did.

A. I connected it with the vacuum gauge, without the baskets, and the gauge did not show any vacuum creation; there was no vacuum created because the inside was not flooded. The air entrained was going as easily back. Never

the proverb, "Easy come, easy go," has been better applied. So it was as freely going one way as another, and we had no vacuum.

Q. There was no piston effect?

A. No piston effect, no vacuum.

Q. Now what are you going to do?

A. Now I am going to create some flooding very rapidly and you will see that even in the absence of baskets, no matter what you did to flood, whether it is the Felten baskets or the onion in my pump, when the flooding is created, then we have vacuum. (Demonstrates with model (Tr. 482:)
on faucet.)

Q. Tell us how you are going to do that.

A. I am going to put the glass under the Felten, so as for a few seconds the water will fill the lower part, and then I will withdraw the glass, so that we will have a condition where the Felten pump is flooded and vacuum starts to be created again. (Witness continues demonstration with glass placed under faucet so that water in glass reaches and covers discharge end of faucet.)

Now we have seen that, without the baskets in the Felten, when the flooding has been restored, as I explained before, the Felten pump created a vacuum equal to what it created before with the baskets, but we have seen also that when there is no flooding there is no vacuum. That is one of the conditions of the water pumps and they have been conceived and built that way; they have to do it; otherwise they don't operate as intended to operate, to create vacuum.

Mr. Freeman: What would happen if you put one basket in?

The Witness: I will do it, if you would like to see it.

Mr. Freeman: Yes, I would like to see it.

The Witness: What we obtained by flooding artificially, we shall try to see if that same result can be effected by one basket. (Witness demon-
(Tr. 483:)
strates model with one basket inserted.)

Mr. Freeman: Now will you take the vacuum-test gauge off?

(Witness complies with request of counsel.)

Mr. Freeman: You are getting some aeration now, aren't you?

The Witness: Yes. We did get some with four.

Mr. Freeman: You are getting far better with one basket than you did with the four?

The Witness: Some better, yes, sir.

Mr. Freeman: You are getting water coming out which is whitish in color, aerated?

The Witness: Now.

Mr. Freeman: Would I do better if I had two openings for air inlet instead of one?

The Witness: If there is such a pump available we shall be glad to test it, but I do not think that would make such special difference as we have seen with the aerators.

Mr. Freeman: Would you be kind enough to hold your finger on the normal air inlet of what you call the pump and then take the little plug out you put in as an extra, and then demonstrate it with only one basket in it? Now put your finger on it and start it up without the plug.
(Tr. 484:)

(Witness complies with request of counsel.)

Mr. Freeman: Is it giving a relatively good aerated stream now?

The Witness: It's a much grayer stream delivered when the orifice was above, and we see some water coming out of the orifice.

Mr. Ely: What orifice? Out of the lower orifice.

Mr. Freeman: What would have happened had you had two orifices, so that you had twice the admission of air into the device than what you have there?

The Witness: Well, we would have had more air coming out—more water coming out.

Mr. Freeman: More aerated water?

The Witness: No; more water coming out the lower orifice.

Mr. Freeman: Is it your position, Mr. Aghnides, that with the extra openings you put in this model you would have more water coming out?

The Witness: Yes.

Mr. Freeman: Would you have more water coming out if you moved the opening down a little bit?

The Witness: If we move further down the opening?

Mr. Freeman: Yes, sir, toward the downstream end.

The Witness: More water would come out. (Tr. 485:)

Mr. Freeman: If you moved it up a little would you have more or less water coming out?

The Witness: Have less.

Mr. Freeman: So it does depend on where you put the opening as to the amount of water that would come out?

The Witness: Yes, sir; in other words, the displacement of water in the pump shows that the more you lower it, the more water will be spitting out of the orifice and the less vacuum will be created.

Mr. Freeman: In order to be fair, I'd like to have you put in two baskets and let's see what happens. This is all news to me, so I am asking only as a matter of enlightenment.

The Witness: (Demonstrating with model as requested.) Now we see clearly there is hardly any air in the stream—I would say there is no air in the stream—and we see the water squirting out from that lower orifice.

Mr. Freeman: In other words, Mr. Aghnides, as you increased the resistance you began to flood the chamber and more water came out?

The Witness: That's right.

Mr. Freeman: And as we decreased the resistance by using only one baffle, or divider, or whatever you want to call it, there was less resistance and less water coming out of the spout?

(Tr. 486:)

The Witness: Yes, sir.

Mr. Freeman: And more aeration?

The Witness: More aeration, but still insufficient aeration.

Mr. Freeman: And we are both now talking about the demonstration of your model that you call the Felten pump; correct?

The Witness: Yes, sir.

Mr. Freeman: Now we found the same to be true with the Spring-Flo, or was it the Velva-Flo, last January; when we put in a plurality of screens, one on top of the other, we had too great resistance and the chamber filled up and water came out of the inlet openings; correct?

The Witness: Yes, we did.

Mr. Freeman: And last January, when we decreased the number of screens so that we had less

resistance, the chamber did not fill up and water did not come out?

The Witness: Yes. Now I shall answer, if I may. Here we have applied the teaching of my patent about proportioning resistance, but, even then, because of the flooding, we could not put the orifice where we wanted it. When the orifice was lower down, then the aeration greatly decreased from what it would be in the upper position. So it is incorrect to say, even when the structure has been modified (Tr. 487:)

in accordance with the teaching of my patent—even then the amount of air going through the device is variable, according to the position of the orifice, whereas that condition does not exist in the aerator.

The Court: We will take our ten-minute recess.

(Brief recess taken.)

Q. (By Mr. Ely:) Now, Mr. Aghnides, do you have any way of demonstrating what will happen to the Felten device if the resistance is increased beyond that shown in the patent?

A. Yes.

Q. All right, will you tell us what you are going to do?

A. Here we have the Felten device made in metal, according to the Felten patent. The parts can be taken out and shown, if the Court desires.

Q. I think you should take them out.

A. At the upstream end of this device, at the inlet end, we have the orifice shown in the Felten patent and below the orifice we have the throat. We have there a pin to keep the space shown in the Felten patent between the orifice and the throat. At the lower part of the device we have the four baskets, as shown in the Felten patent, and that is the full device. We have, of course, the main body containing those parts. I shall put them back now.

(Tr. 488:)

Q. Now will you put that back together again, and then let's take it over and put it on the apparatus and demonstrate it, first, just as you have it there.

Mr. Freeman: Do you have a drawing?

Mr. Ely: Yes, I have a drawing here of this device Mr. Aghnides has just shown to the Court, and I am going to ask that it (the model) be marked (Tr. 489:)
in evidence as Plaintiff's Exhibit No. 56.

(The model referred to was received in evidence as Plaintiff's Exhibit 56.)

Mr. Ely: Then I have a drawing which shows that element 56, with the addition which is going to be put on it, and we will mark the drawing now as 57.

(The drawing referred to was received in evidence as Plaintiff's Exhibit 57.)

Mr. Ely: I think I will change the order of my questions, inasmuch as this drawing has been introduced.

Q. (By Mr. Ely:) What is the part which is shown below this element, Plaintiff's Exhibit 56? It seems that the drawing is divided. The part you have been showing to the Court is in the upper part of the drawing. What is that in the lower part of the drawing?

A. In the lower part of the drawing I have twenty-one screens which will be added to the resistance offered by the baskets.

Q. That is, you have a chamber there which is threaded, so that you can thread it in the bottom of 56—and that will add what?

A. That will add twenty-one screens of the type used in the Velva-Flo aerator made by Firestone.

(Tr. 490:)

Q. The added part you have is right here, is it not (indicating)?

A. That's right.

Q. Do you want to take that part and show it to the Court?

The Court: It can be marked 58, then.

Mr. Hamilton: Could we mark that as 56-A, so we can keep it in the box?

The Court: That will be all right.

(The part referred to was received in evidence as Plaintiff's Exhibit 56-A.)

The Witness: Exhibit 56-A comprises seven units of the Firestone aerator. There are three screens in each of them, which makes in total twenty-one spaced screens. In a previous demonstration last January we had seen that if, in the aerator, you add two or three screens the operation is no more normal; water comes out through the vents, through the orifices intended to suck in air. Here we are keeping the four baskets Felten showed in his patent and we are adding twenty-one screens of the type used in my aerator, to show that Felton has no proportioning of the stream velocity with the elements below necessary to flood the chamber.

Mr. Ely: I am going to mark the part shown on the drawing, Plaintiff's Exhibit 57, with "56" and "56-A."

(Tr. 491:)

Q. (By Mr. Ely:) Now, Mr. Aghnides, will you take 56, which is the pump alone, will you take that over to the apparatus and demonstrate it?

A. Now we have Felton without any addition, with the lateral pipe intended to suck ozone open to the atmosphere. We shall demonstrate the vacuum it is able to create. (Demonstrates model on faucet.) The gauge shows a vacuum of twenty-two and a half inches of mercury.

Now we shall add the resistance offered by twenty-one screens to what it already contains.

Mr. Freeman: Now this is no showing of Felten; this is something that isn't in the prior art; there is no patent that shows it.

Mr. Ely: This is putting 56 and 56-A together.

Mr. Freeman: But there is no prior patent that shows 56-A.

The Witness: This will illustrate that no proportioning is necessary; and we have seen that before when, instead of four baskets, we put only one; and now we have the four baskets in plus twenty-one screens. (Demonstrates model on faucet.)

Q. (By Mr. Ely:) What is your reading?

A. We read on the gauge a vacuum of twenty-three and a half inches, which shows that the addition of twenty-one screens, which is in itself seven times the resistance used in an aerator, it shows that the vacuum is created

(Tr. 492:)

just as well, if not better. In other words, it does not destroy the purpose of the device, neither its function.

Q. Now, with respect to your own aerator, what difference, if any, does it make if you increase the resistance in a manner somewhat similar to what you have done here?

A. Well, we have demonstrated last January that if, in the aerator, we add a couple of screens, for each additional screen we have less air entrained by the device. Then when we put the third screen the chamber is completely flooded, no aeration whatsoever takes place, so the device becomes completely useless.

Q. I wish you would just do that test again right now. What is this, first; this is Plaintiff's Exhibit 42, isn't it, as I recall it?

A. Here we have an aerator built by Firestone. In it we are adding three screens on top of the other normal three screens.

Q. Having six in all then?

A. Having six in all. We are attaching this device to the tap (demonstrating with model on faucet) to show that no aeration takes place any more, that the chamber is flooded and the water squirts out from the orifices which were intended to draw in air. In other words, the aerator has elements which must be proportioned. They were (Tr. 493:)

proportioned before, and a slight disturbance by addition of some resistance disrupts the equilibrium and the aerator is no more an aerator, whereas, in the pumps there is no such teaching, no such necessity; you can put anything that will permit the flooding of the chamber. In fact, as we have seen, the more you flood, the more you add length, the better vacuum you obtain.

* * *

(Tr. 506:)

Q. (By Mr. Ely:) Now, Mr. Aghnides, in testing these various devices, you have, by the glass test, demonstrated, as I understand it, in a way, the difference in the amount of air entrained by vacuum pumps and by aerators made under your patent?

A. Right.

Q. That is more or less a rule-of-thumb way of showing it. Do you have any other way of showing the comparative efficiency of the two types of devices in this respect, the amount of air entrained?

A. Yes. In all these tests where the water was falling in a normal position, the water, that is to say, the stream, was following the law of gravitation and falling down, so we could not see how fast it was running and how much air was in the stream, except, in a very empirical manner, by the glass test.

Now I have a series of tests which are upside down; in other words, the stream goes in the opposite direction from gravitation; it goes skyward. Then we can see how much water comes out, how high the water shoots up when the holes through which air enters are open and when those holes are closed, to show that when the device is operating in a condition to draw in air, if there is a lot of air the original amount of water shoots up very high, and if there is very little amount of air then the change is (Tr. 507:)
very little too.

Here I have a gooseneck which I shall attach to the faucet in the center, and on the other end of this gooseneck, the free end, I shall attach different devices, for making comparisons of the streams with and without air, all other conditions being left equal.

Mr. Freeman: The water going upside down?
The Witness: Yes, the water going upside down.

• • •

(Tr. 508:)

The Witness: We have now a stream of water without air shooting up only one inch and a half. When the air orifice is open the water shoots up two inches and a quarter. So the increase of the volume

of the water in Felten is shown by those two figures, with and without air. We can see how much air there was in and how much swelling of the stream (Tr. 509:)
took place.

Q. Now will you perform the same experiment with your own vacuum pump, Plaintiff's Exhibit No. 47? What is the diameter of the outlet opening in the Aghnides vacuum pump?

A. Three-eighths of an inch discharge opening.

Now I am attaching my own vacuum pump onto the gooseneck (demonstrates.) Here again I closed the orifice provided for the admission of the gas and we had a stream without air six inches high. When I remove my finger and air is admitted, the total height rises from six to six and three-quarter inches, showing that there is very little air in the stream.

Q. Now let's test the metal Felten vacuum pump, which was Plaintiff's Exhibit 56.

A. Here I am holding the metal-made Felten pump, which has an outlet orifice of half an inch. (Demonstrating with model on gooseneck.) Here we have a stream without air of one inch, and, when the air orifice is left open, one and a half to one and three-quarters inches high. This metal-made pump, as we are seeing, produces very comparable results with the plastic pump we just tested, as the figures show.

Q. Let's take the Spring-Flo and tell us what you are going to do with the Spring-Flo in making the same tests, Mr. Aghnides. Take a look at it and see if it's all right, Mr. (Tr. 510:)
Aghnides. I am handing you Plaintiff's Exhibit 29.

A. I am holding a Spring-Flo water aerator, made by Chase Brass and Copper Company, and I find in it all the parts which should be in the device. Then I am going to

attach it on the gooseneck and close the slots, in other words, the openings for the admission of air, with a rubber belt. The inner diameter is five-eighths of an inch. Now the Spring-Flo is attached, with the air holds closed, and we shall have a stream of water without air (demonstrating); one and a half to one and three-quarter inches high, height of water without air. Now I shall take the rubber band off, so as to admit air into the stream. A twelve to twelve and a quarter inch bubbly mushrooming stream.

Q. What was the character of the stream; was it coherent all the way up to where it broke?

A. It was coherent all the way up and it mushroomed into a lot of bubbles and you could see it was a very rich stream in air, because the difference in height with and without air was one and a half to one and three-quarters to twelve to twelve and a quarter.

* * *

(Tr. 511:)

Q. (By Mr. Ely:) The increase in the volume due to the mixture of air, is that reflected in the height of the column?

A. Yes. I don't see any other factor changed. The only factor changed here is the opening or closing of the lateral air slots. All other conditions remain equal. So as soon as the air gets in the water is broken up and the air is entrapped and the additional air raises the height of that

(Tr. 512:)

from about two inches to about twelve inches.

Q. It was really, as a matter of fact, one and a half to one and three-quarters to twelve to twelve and a quarter?

A. That's right. Any errors in one case are repeated in the other; they are all subjected to the same conditions. The only change is opening and closing of air vents, and it shows how much air has been drawn in in each case.

Q. Now this is the model which was Plaintiff's Exhibit No. 28.

A. Here we have a coupling, to be able to attach it to the gooseneck, and below the coupling is Figure 4 as we had produced and demonstrated last January.

Mr. Freeman: That is one screen and an apertured diaphragm?

The Witness: No, sir; two screens.

Mr. Freeman: In other words, the first patent?

The Witness: The first patent.

Q. (By Mr. Ely:) Will you put it on and will you give us the dimensions, please.

A. One-half inch discharge orifice. Here again I have closed the orifices provided for the admission of air with a rubber band, and we shall have a stream of water without air (demonstrating) which is six inches high; and we see that when we open the air vents we obtain thirty-two inches of aerated column of water, when we make this (Tr. 513:)
upside-down test with the aerator corresponding to Figure 4 of the patent.

Q. In that case what kind of column did you get all the way up?

A. We obtained again a bubbly stream all the way up to the top.

Q. Did the bubbles stay in the stream all the way up to where it broke at the top?

A. They do.

Q. Again what was the cause of the increase in height from six inches to thirty-two inches?

A. Again it was because of the inclusion in the water of a tremendous volume of air in the form of bubbles which swelled the stream, which had no other place to go except through the discharge end upwards.

Q. Now I want you to take the Mel-O-Flo aerator and perform the same tests.

A. Here I have a Mel-O-Flo aerator—I am holding it—on top of which I shall place three legs to keep the floating center member in position, because when we shall turn this aerator upside down that floating member which is in the ring with the onion would naturally fall back. For that reason I built a ring with legs to keep that in position when it is in operation.

(Tr. 514:)

Q. Did you give us the dimension of the outlet end?

A. Five-eighths of an inch. Now, as before, I shall put a rubber band around the orifice provided for the admission of air, so that we may obtain a stream without air and measure its height (demonstrating). It is two and a half to three inches high. Now when we open the air vents, the orifices for the admission of air, we have a stream eighteen and a half inches high. Here again we see that the performance is comparable to that of the Spring-Flo aerator in the amount of air added to the stream of water.

Mr. Ely: Is that the Mel-O-Flo that was in evidence before?

Mr. Hamilton: No, it is not; it is the Mel-O-Flo with this additional ring.

Q. (By Mr. Ely:) Mr. Aghnides, is that identical with the Mel-O-Flo which has been previously offered in the case?

A. Yes, all the parts are the same production.

Mr. Ely: I will introduce this particular Mel-O-Flo with the spider to hold the diaphragm in place as Plaintiff's Exhibit 58.

(The model referred to was received in evidence as Plaintiff's Exhibit 58.)

Q. (By Mr. Ely:) Now, Mr. Aghnides, what was the reason why you got such a small increase in volume in the case of the Aghnides vacuum pump and the two Felten
(Tr. 515:)
vacuum pumps as compared with the results you got from the Spring-Flo and the Velva-Flo?

A. Well, the reason is very simple. As I have shown this morning, vacuum pumps have a portion which creates a vacuum, as in my pump and as in Felten's pump, and that portion, which is flooded with water, as we have seen this morning, does not exist in the aerators. Now there is a very important reason for which the difference is so great between the two devices, pumps and aerators. As soon as we once produce vacuum, as we have seen on the gauge, and that vacuum is created at the expense of the greatest part of the energy of the water, naturally there is little energy left for the entrainment of a big volume of air. In the concept of the aerator and the construction of it there is not such a portion—I mean a portion that creates vacuum—it does not exist in the aerators and, as a consequence, the energy of the water is not expended for a purpose which is not desired in an aerator; in other words, it is not expended to create vacuum, because an aerator does not need to create a vacuum.

For these structural reasons and reasons of the law of conservation of energy, if you spend the energy of the water for one purpose, you can't spend it for another; and vacuum pumps, as we have seen, spend it greatly for creating a high degree of vacuum.
(Tr. 516:)

So it is for the first time, with this concept of my aerator, that the whole and total energy of the water pressure has

been made available for one sole purpose, to entrain the greatest amount of air, to divide and mix that air with the water as well as possible, so that you obtain not only a great deal of foam, but a foam of good quality. The foam will be better if the amount of water in respect to the air contained is very small; in other words, if you make out of one inch of one stream eight inches of foam, you will have a real foam, a rich foam; whereas, if you stretch one inch of water into one inch and a half you have so little air in it that, for all practical purposes, the water is not aerated. The mere fact that there are some bubbles in it can not qualify the water as being aerated. Naturally, everybody is free to build one way or the other, but apparently nobody thought to aerate the water, in the pumps to aerate the water, because they had been known for decades; scientists have seen those vacuum pumps for decades.

Mr. Freeman: I object to what scientists have seen.

The Court: Strike that out.

Mr. Ely: I think that is sufficient, Mr. Aghnides.

Q. (By Mr. Ely:) Mr. Aghnides, you were questioned on cross-examination and some reference made to a Solomon patent. I show you a copy of the Solomon British (Tr. 517:)
patent No. 406,316. Are you familiar with that patent?

A. Yes, I am.

Q. Have you any models showing the construction of the Solomon device?

A. I do.

Q. What is this Solomon patent, what was its purpose; do you know?

A. It was intended to aerate beer; and I have not tried

to see if it aerates beer, but I did try to see if it gives a bubbly stream, and I find it does not give any such thing.

Q. How many models of the Solomon patent do you have?

A. I think I have two.

Q. That is, you have a model in accordance with what figures; Figures 2 and 3?

A. One without the valve and one with.

* * *

(Tr. 518:)

Q. (By Mr. Ely:) Go ahead and make your demonstration.

A. (Demonstrating with model on faucet and water running.) Here we have a divergent, splashing, non-coherent stream of water. If we put any object under it (Tr. 519:)
it will splash all over and the stream is a spray-like stream. There are no bubbles in the stream; the stream is divergent, harsh, incoherent and air-free.

Q. Is it comparable with the stream that is obtained from your aerators?

A. No relation whatsoever. Neither the patent ever said it was anything like it, because this beer aerator was made to aerate beer, and beer, under the slightest agitation, produces itself in froth, and if this device was to produce a bubbly stream, as the aerator does, it would have been impossible to draw a single glass of beer; you would have nothing but froth.

Q. Now, Mr. Aghnides, will you take the other model—I understand you have another model of the Solomon device which, I understand, is made in accordance with Figures 7 and 8?

A. Yes, sir.

* * *

(Tr. 520:)

Q. (By Mr. Ely:) Mr. Aghnides, just how does that operate?

A. There is a valve upst eam in which, when the pressure of the beer goes down, it permits the valve to go up; when the pressure of the beer is below a certain degree (Tr. 521:)
that valve is unable to be pushed down, so it goes up and seals the upper orifice of the device so there is no beer going through and there is no drip.

• • •

Q. (By Mr. Ely:) Now will you demonstrate that, Mr. Aghnides, on your tank?

A. (Demonstrating model on faucet with water running.) Here we see, as before, an incoherent, divergent, splashing, bubble-free stream. Now if I open this other faucet, so as to decrease the pressure of the water inside the Solomon device, we shall see the spring-effect operating, (Tr. 522:)
and get immediately no drip or flow of beer.

• • •

(Tr. 523:)

Re-cross Examination by Mr. Freeman:

• • •

(Tr. 581:)

Re-direct Examination by Mr. Ely:

Q. Now, going to the subject of this drawing which Mr. Freeman has just spoken of, Plaintiff's Exhibit 45, have you had made since our adjourning on yesterday a second model of the Felten patent?

A. Yes, sir.

• • •

(Tr. 582:)

The Court: Let's don't go back over what was done yesterday. Tell us what you have done to this differently from what you had yesterday.

The Witness: The one we had yesterday had a slight difference with the one we have today, which, in my opinion, does not produce any different results, but, to satisfy the Court, we had this new one made to look and be exactly the same as the Felten drawing shows. You will see, your Honor, that this lateral pipe, the orifice continues inside and protrudes a little beyond the tubular part below.

* * *

(Tr. 585:)

The Court: In respect to the one that was made yesterday in comparison to the one that has been used heretofore, is there any other significant difference?

The Witness: No. The point was, as Mr. Freeman indicated yesterday, in our model the position of that lateral hole changes somehow or runs so it wasn't in accordance with the patent. Now we have seen what it did and we have the one here which, to our best ability, is exactly what Felten shows, and we will prove to this Court that it didn't make any material difference, as we thought it would not make.

Mr. Ely: I want to introduce in evidence as Plaintiff's next exhibit the model which Mr. Aghnides has produced this morning, as Plaintiff's Exhibit 62.

(The model referred to was received in evidence as Plaintiff's Exhibit 62.)

Q. (By Mr. Ely:) How about the baskets; did you have time to make a new set of baskets?

A. No, we didn't have time to make a new set of baskets, so we shall use the baskets that we used in the model demonstrated yesterday.

Mr. Ely: Will the Court permit us to go through the demonstrations we did with the model, Exhibit 44?

The Court: Yes, go ahead.

(Tr. 597:)

J. W. McGarry, a witness for the plaintiffs, being first duly sworn, testified as follows:

Direct Examination by Mr. Ely:

Q. Please state your name and residence, Mr. McGarry.

A. My name is J. W. McGarry. I live in Waterbury, Connecticut.

Q. What is your present occupation?

A. I am retired, sir.

Q. What was your former occupation?

A. I was General Sales Manager of the Waterbury Manufacturing Division of the Chase Brass & Copper Company.

(Tr. 598:)

Q. How long had you been with the Chase Brass & Copper Company?

A. Forty-four and a half years.

Q. How long had you been connected with the faucet business?

A. About that length of time.

Q. This Spring-Flo device, concerning which there has been considerable testimony in this case—you have been in court, haven't you, during the proceeding?

A. Yes, sir.

Q. Where was that made: where would you make the Spring-Flo?

A. At Waterbury, Connecticut.

Q. And under license from Mr. Aghnides?

A. Under license from Mr. Aghnides, yes, sir.

Q. When was Mr. Aghnides' aerator first called to your attention, and how?

A. It was brought to us in the spring of 1941 in the form of samples and the patents.

Q. Were there any metal aerators in existence at that time, made under the Aghnides patent, that you know of?

A. Yes, the Softflo was made by the Chicago Faucet Company.

Q. Did you examine the Chicago Faucet aerator made under the Aghnides patent at that time?

(Tr. 599:)

A. Yes, sir.

Q. What did you do; what induced you to take the license under the patent?

A. Well, we were interested in the patent first because at that time Chase was constantly striving to improve the flow of water from its faucets, and when this aerator was brought to us by Mr. Aghnides and put under test, we were very much impressed with the stream, because it was the solution of the problem of obtaining an improved stream. We became very enthusiastic about it when we found the improved stream also contained aerated water. We knew then it would be a very welcome device in every American home and would be a very desirable manufacture for the Chase Brass & Copper Company if the patent was found to be valid.

We instituted a patent search and, during the interim, we made numerous samples of aerators embodying constructions which we felt were non-conflicting with the Aghnides construction, for the purpose of seeing what we could develop in comparable performance. We could produce nothing that did compare with the Aghnides performance and, consequently, when the conclusion was that

the patents were valid, we made arrangements with Aghnides to produce and sell the aerator in the United States.

Q. Do you recall how much time elapsed from the time, you say, in 1941, that the Aghnides aerator was called to (Tr. 600:)
your attention in this manner by Mr. Aghnides and the time you took the license?

A. About three years.

Q. You took the license, as I recall, in 1944?

A. 1944, I think the record discloses.

* * *

(Tr. 616:)

Mr. Freeman: If your Honor please, when the deposition was taken we then had a defense of misuse and that was directed toward the defense of misuse. I am not urging it now, but I think the advertisement is still good with respect to being on sale.

Mr. Reddy: Your Honor, with respect to the trademark which was introduced in evidence, I'd like to ask Mr. Freeman if he is relying on that as proof of sale, of a first sale in March, inasmuch as he just agreed with me as to the first sale.

Mr. Freeman: I agreed with you as to the first sale, so far as the records you have, was about May, and I will agree that that is it.

* * *

NORMAN LETTVIN, a witness for the defendant, being first duly sworn, testified as follows:

Cross Examination by Mr. Ely:

(Tr. 725:)

Q. (By Mr. Ely:) Now are you familiar with the routine and procedure in the British Patent Office in handling applications?

A. Only from what my patent experience has been with the British Patent Office.

Q. That is what I asked you. Is it not a fact that during the prosecution of a British application a patent will (Tr. 726:)

be cited and you will be asked to amend your application to make reference to the patent which has been cited by the British Patent Office?

A. Correct; when the patent is considered pertinent.

Q. They will ask you to make a reference in your specification to that patent which has been cited?

A. Correct.

Q. And we now have a somewhat similar practice in the United States Patent Office, where, at the end of the patent, are listed references cited?

A. Correct.

Q. Now the British Patent Office allowed Patent No. 408687 over the Solomon British patent, did they not?

A. Correct.

Q. And I will read you the claim, the first claim, of that patent:

> "A device for intimately mixing air with a liquid flowing under pressure, comprising an injector portion provided upstream of the part where it aspirates air with a perforated cross partition that divides the stream of liquid into a number of small streams . . ."

In other words, that is the diaphragm, is it not?

A. Upstream diaphragm.

Q. (Reading:)

> ". . . and downstream the said part with an atom-
(Tr. 727:)
> izing and mixing portion comprising one or more finely perforated plates . . ."?

A. Correct.

Q. That corresponds to the screen in the American patent and the British patent?

A. Correct.

Q. Then the claim goes on:

> ". . . so that the resulting jet has a substantially uniform pressure throughout its cross section and consists of a uniformly distributed, finely broken mixture of liquid and air having the particles of liquid and air in intimate contact with each other even after issuing from the said device"?

A. Correct.

Q. That describes a coherent stream in which the bubbles are imprisoned as they leave the device, does it not?

A. If you mean by "coherent stream" one where the resulting jet has a substantially uniform pressure throughout its cross-section and consists of a uniformly distributed, finely broken mixture of liquid and air having the particles of liquid and air in intimate contact with each other even after issuing from the said device, if that whole definition is your definition of "coherent stream," then that is true.

* * *

(Tr: 730:)

Q. (By Mr. Ely:) You didn't answer my question. I said that you know—and I will start over again—you know that in the British patent 625,084 there is a reference to the former British patent 468,687.

A. Correct.

Q. And you have said that in the former British patent 468,687 there was a reference to the Solomon patent?

A. Yes, sir.

Q. You will go that far with me, will you?

(Tr. 731:)

A. Yes, sir.

Q. So the examiner had before him, or had knowledge, when he was examining 625,084, of Patent No. 468,687?

Q. We could infer that, but I have no way of knowing it.

Q. And, if he did, he of course knew what was in the text of Patent No. 468,687?

A. He should have read it.

Q. Now they did allow the British patent No. 625,084, did they not?

A. Yes.

Q. And that claim reads as follows:

> "A device for producing a jet of water containing air bubbles, comprising an injector portion which is provided, upstream of the part where it aspirates air, with a perforated cross partition . . ."

Now that is the diaphragm, isn't it?

A. Yes, sir.

Q. (Continuing reading:)

> ". . . and downstream the said part with an atomising and mixing part comprising one or more finely perforated plates, characterised in that the holes in said plate or plates are so small and close together as to divide the air into particles of such size as to form small air bubbles having a tendency to remain in suspension in the jet of liquid, the holes in said plate or plates, or the number of these plates or (Tr. 732:)
> the outlet of the device being such as to force the liquid streamlets issuing from said holes to join together and to form at the outlet a single stream or jet."

You are familiar with that language?

A. Yes.

Q. Now those plates referred to in the claim of this British patent in the downstream part of the device form a resistance, do they not?

A. Yes, they are resistance screens.

Q. And it says that the holes in those plates are so small and close together as to divide the air into particles of such size as to form small air bubbles having a tendency to remain in suspension in the jet of liquid; that's what it says, isn't it?

A. Yes, sir.

Q. And you gather from that that the resistance described in the claim of this second British patent is a resistance which is sufficient to cause the aerated stream of water to be of such character that the bubbles are suspended therein, do you?

A. In the British patent?

Q. Yes, sir.

* * * *

(Tr. 733:)

Q. (By Mr. Ely:) Now let's talk about Solomon a minute. Will you look at the provisional specification of the Solomon patent, the very first page, the first provisional specification, where it says:

> "... each stream being broken upon a point, or end, of the projecting peg, so that turbulent flow is assured."

A. Where do you find that?

Q. Line 36.

A. I can't find that—oh, "In operating the device"—

(Tr. 734:)

I read that now.

Q. Reading:

"In operating the device the liquid passes through the set of holes that are bored right through, each stream being broken upon a point, or end, of the projecting peg . . ."

You read that, do you not?

A. Yes, sir.

Q. Do you find in the first provisional specification any description of anything that reunites the strains after they are broken?

A. Only this statement, beginning in line 45 or 46:

". . . and consequently the liquid and air are thoroughly mixed before emerging from the open end of the device."

Q. That does not say that the streams are reunited?

A. It doesn't use those words.

Q. Also, in the second provisional specification, over on page 2, line 26, it says:

"When a tap provided with the device is opened liquid will flow through the set of passages that extend from end to end of the solid part of the cylinder and will impinge on the transversely disposed pegs of the device causing turbulence of the liquid."

You don't find in there any statement that the liquid is thereafter reunited in a coherent jet, do you? (Tr. 735:)

A. None other than reference being had to the liquid mixing with air.

Q. Now, over on page 3 of the complete specification, beginning line 30, the first column, it says:

"The walls or sides of the lower or hollow part of the cylinder are provided at a suitable distance below

the upper solid part of the cylinder with holes into which are driven pegs of suitable length which converge toward the centre or axis of the cylinder and are transversely disposed with respect to the passages that extend from end to end of the solid part of the cylinder, and serve as a means for breaking up the liquid as it emerges from the lower ends of said passages."

You find that?

A. Yes, sir.

Q. You do not find any description of the broken-up streams?

A. Not at that point; and I just call your attention to a further description on page 4, column 1, which I had read earlier, beginning line 3:

"At the same time air will be drawn through the other set of passages 5 and become mixed with the liquid, thereby aerating same and causing a foam or froth to be formed on the upper part of the liquid when the latter is drawn off into a glass or vessel placed below the device."

(Tr. 736:)

Q. That is the upper part of the liquid when the latter is drawn off in a glass placed below the device?

A. That's correct.

Q. Now let's refer to the Hyatt patent, 326,221, and particularly to Figure 5. Now that patent, as I understand it, is for a device for purifying water for cities or large industrial installations. Is that true?

A. Correct.

Q. It does not deliver an aerated stream of water at the point of use, does it?

A. No, but it delivers an aerated stream of water at the end of the operative device shown.

Q. But, as you see that device, looking at Figure 5, that device in the lower right-hand corner of the figure is a filter, is it not?

A. Correct.

Q. And the water flows into the filter and then into the main?

A. Correct.

Q. So that this device does not deliver a fully aerated stream of water at the point of use, does it?

A. No, sir.

Q. It is, in fact, a water-treatment plant, is it not? (Tr. 737:)

A. In the general use of the term, yes.

Q. There is no proportioning of the resistance to the velocity of the stream so as to produce a coherent jet of water with the bubbles imprisoned therein, is there?

A. I disagree with that.

Q. Wherein do you find anything to that effect?

A. There is nothing stated, but you take those five screens, plus water coming in and air coming in, and I refer you to Figure 3 of the second Aghnides patent, which shows five screens and water coming in above the five screens and air coming in through the side, and, if that delivers an aerated stream, this will deliver an aerated stream.

Q. This delivers a stream which is confined in the pipes, does it not?

A. Yes.

Q. Then there is no jet, in the sense of an open jet, which is filled with bubbles imprisoned therein?

A. You mean from the outlet end of the device?

Q. Yes, sir.

A. There appears to be none.

Q. Now look at the upper (lower) part of Figure 5. There is no device in the end of the pipe D for increasing the velocity of the flow of the water any higher than it is through the balance of the pipe?

(Tr. 738:)

A. Whatever the velocity of the water is in that pipe will be the velocity—

Q. Through the whole distance of the pipe?

A. Yes, sir.

Q. Now let's turn to Ferguson. That Ferguson patent, Figure 1, shows an old-time bathtub, does it not?

A. I guess so.

Q. You perhaps do not remember those old-time bathtubs, but this is a device which is intended to be placed in the end of one of those old-time bathtubs, is it not?

A. As it appears in Fig. 1.

Q. And it hangs over the edge and extends for some distance above the upper edge of the bathtub?

A. Yes.

Q. Then, over at the right we see a cylinder f, do we not?

A. A cylinder f, yes.

Q. That is intended to hold gas under pressure, is it not?

A. I presume so.

Q. You know it is, don't you?

A. Yes, sir.

Q. And that gas under pressure goes through the pipe f, and then into pipe e, shown more fully in Figure 2?

A. I said I presumed that f is under pressure, and you said I know. I can't find it in the specification, but I

(Tr. 739:)

will go along with you; I presume f is under pressure. What was this last question?

Q. And I say the gas is delivered by the pipe e, is it not, that extends inward?

A. It is delivered through the hose f, and then through e, yes, that's correct.

Q. Now the pressure of the gas as it issues from the lower end of pipe e draws the water, or whatever it may be, from the cylinder a, and the two issue inward as a spray, do they not, against the thimble h?

A. You state that the gas draws the water?

Q. Well, the gas from the pipe e will draw the water down through the pipe d, in addition to the force of gravity; is that right?

A. I don't see that at all. In fact, as I recall—I would have to check this, but you see that a', that pipe coming down? I think that is from the water supply of the house. You see the arrow up above that pipe? I think that is from the water supply of the house, and that enters into the chamber and, obviously, if everything is open, the water pressure of the house would push the water through the cylinder a, and then through the pipe b, and through the pipe c into the pipe d, and the water would entrain the gas, rather than the gas entrain the water.

(Tr. 740:)

Now let me point this out: If what you have just asked were true, that the gas drew the water, it would be practically impossible, because let's assume—

Q. I didn't say that, Mr. Lettvin. I said, and you agreed with me, that the gas in the cylinder f was under pressure.

A. Yes, sir.

Q. Now what I said, or, at least, what I intended to say, was that the gas is issuing from the pipe e under pressure and that mingles—

A. It would when the pressure in the cylinder was high, but, as you evacuated the cylinder, the pressure would progressively fall.

Q. If there wasn't any pressure in the cylinder, then there wouldn't be any gas flowing out of the cylinder?

A. Oh, yes, because the water, being under pressure, would affect that chamber, or suck out the gas out of the gas cylinder.

Q. Then that acts as a vacuum pump; is that right?

A. Well, for a while it acts as a mixing device, when the gas is under pressure. As the gas pressure falls and assistance is needed to draw it in, then it acts as an aspirator.

Q. Now the water which is received in the device is (Tr. 741:)
held in this tank a, is it not?

A. It goes into a, and then from a into the pipe d.

Q. And that a, that is where you put the salts, is it not?

A. Correct.

Q. And the salts and the carbon dioxide, which I believe is a gas, mingle together and have some sort of chemical reaction; is that right?

Q. Well, the salts, as I understand it, dissolve in the water and, therefore, it is a solution of salt. When I say "solution," it goes fully in and you have some reaction even with the water, and then, when it goes through, I imagine the salt solution mixes with the gas.

Q. That's correct. Now let's take the Lockwood patent, number 1,195,044. Now that is a device for treating saccharine juices, is it not?

A. Correct.

Q. And the casing which we see in Figure 2 is closed and it has two inlets, one 4 and the other 5?

A. Correct.

Q. And the inlet 4 is for the admission of sulphur dioxide gas?

A. Yes. You said two inlets. You meant gas inlets 4 and 5?

Q. There are two gas inlets; one is 4, which was for (Tr. 742:)
the admission of sulphur dioxide?

A. 4 for the admission of sulphur dioxide, yes.

Q. And the other gas inlet, 5, for the admission of carbon dioxide?

A. Correct.

Q. And the intent is that the sulphur dioxide and the carbon dioxide should react with the raw cane juice for decolorizing or bleaching; is that right?

A. Did you read that? If it's in the "spec", that's what it's for.

Q. Well, read the paragraph beginning at line 16 on page 1.

Q. Yes, sir, I find that.

Q. And over on the second column, line 79:

> "The gases naturally act on the juice during the passage through the down-pipe, and further react on the liquid in the retarder, resulting in some effective clarification and bleaching."

Is that right?

A. That's correct.

Q. Then the saccharine juice and gases are discharged into the pipe 29, are they not?

A. Yes.

Q. Then from the pipe 29 they go down into a long stand-pipe 30?

A. Correct.

(Tr. 743:)

Q. And then go into what is called the retarder, which is 33?

A. Correct.

Q. What is the purpose of having these discharge into the pipe and then into the retarder?

A. If I recall correctly, the purpose was to maintain the gases in contact with the saccharine juices as long as possible, so that you could get sufficient reaction.

Q. Now what is the size of this device?

A. I have no knowledge.

Q. Will you look at Figure 1, please?

A. Yes, sir.

Q. You see on the sidewall a faucet, do you not?

A. Yes.

Q. Now that gives some indication as to the size—

(At this point the hearing was recessed on account of the sudden illness of Mr. Ely, of counsel for the plaintiff.).

• • •

(Tr. 746:)

The trial of the above-entitled matter, having been adjourned on October 13, 1955, was resumed on Tuesday, November 6, 1955, at 10:00 A. M., before Honorable Johnson J. Hayes, United States Judge, in the grand jury room of the United States Post Office and Court House Building, Greensboro, North Carolina.

• • •

(Tr. 747:)

NORMAN LETTVIN, a witness for the defendant, having been previously duly sworn, resumed the stand and testified further as follows:

Cross Examination (cont'd) by Mr. Adams:

Q. At the very end of our previous session, Mr. Lettvin,

(Tr. 748:)

you were being asked about the size of the faucet in the Lockwood patent, or the size of the apparatus, I think it was. You were asked to look at Figure 1 and, in connection with determining the size of the apparatus, you were asked whether on the side wall there was a faucet 42; and then the question which was not answered was, "Now, that gives some indication as to the size", and I ask you that is a fact, is it not?

A. It gives indication of the size of the apparatus in which the type of mixing device of Figure 2 is embodied.

* * *

(Tr. 749:)

Q. (By Mr. Adams:) Now did you stop at all to estimate, if 42 is the faucet, how big this apparatus would be?

A. No. I was merely interested in the principle of a device for bringing in liquid and causing the liquid to break up and using that broken-up liquid in the jets to draw in gases and to mix the gases with the broken-up

(Tr. 750:)

liquid and pass out through a constricted orifice, which I think is shown as 8 in Figure 2, and the principle remains the same, whether it's for a large apparatus or for a small apparatus.

Q. And do you know anything about what results you get with such an apparatus; have you ever tried it?

A. I believe I have seen one tested and it produced a mixture of water and air when the arms 4 and 5, the conduits 4 and 5, were open to the air.

Q. What sort of saccharine juices were put through the one that you tested?

A. I said I saw it tested with water and I said it produced—

Q. How big was that?

A. The device was arranged to be fitted at the end of a faucet.

Q. So it was different than it is in this Lockwood patent?

A. Not at all; it embodied the identical principle.

Q. Different size, different proportions?

A. The same principle.

Q. Did you build it?

A. No. It was built under my supervision and direction.

Q. But this Lockwood device certainly is not designed, (Tr. 751:)
as shown in the patent, to be attached to a faucet, is it?

A. No, sir.

Q. Now would you turn to the Claflin patent. That, I believe, is number 3 in the binder. It is number 881,548. Now, as I understand it—correct me if I am wrong—that is directed to what is called there a vacuum faucet; is that right?

A. I find the words "a liquid supplying faucet" on page—

Q. Now will you look at page 2, column 1, line 58?

A. Yes, the words "vacuum faucet" appear there.

* * *

(Tr. 752:)

Q. (By Mr. Adams:) But, in so far as it operates as a vacuum faucet as distinguished from a water faucet, it is intended to operate in a system which is normally under vacuum; is that right?

A. The particular embodiment was for sucking air from a system which is enclosed.

Q. You mean enclosed in the sense that no air could leak into it?

A. Well, in the ideal case you would have no air leaking in, but if air leaked in, which it most probably did, air would leak in through the system.

Q. In the specification the tank 38 in Figure 6 is referred to as a vacuum tank, is it not—and I direct your attention to page 2, column 1, line 53?

A. Yes, vacuum chamber 38.

Q. It is a well-known type of steam-heating system, known as a vacuum steam heating system, isn't it?

A. Oh, yes, I believe—

Q. And it is intended to operate under vacuum, isn't it?

A. When you say "well-known", I would say that, within this patent, it was designed for a vacuum steam heating system. I don't know what the art was other than that.

Q. You dont know about vacuum steam heating systems?

A. I know that they exist, but I don't know whether

(Tr. 753:)

this was the type of system that it was.

Q. Anyway, normally, the way the system is intended to operate, tank 38 is a vacuum tank and the internal piping of the steam system is intended to be under vacuum all the time; is that not so?

A. In the desirable form, yes.

Q. And the precaution is taken to include what are called check valves 42, which are shown at the upper right-hand side of Figure 6 and lower down on the right-hand side of Figure 6 and again in Figure 1; is that right?

A. Yes.

Q. And those check valves are put there for the purpose of keeping any air from getting into the system; is that right?

A. It is for preventing a back-flow of air into the system when the faucet is turned off.

* * *

(Tr. 757:)

A. I'm not speaking either as a home-owner or maker or seller. I have studied this art and believe that to be the fact.

Q. You have studied it as a patent attorney; isn't that right?

A. That's correct, and as an engineer.

Q. What were you doing as an engineer in this art?

A. Pardon.

Q. What were you doing as an engineer in this so-called water-aerating art?

A. I haven't done anything in the water-aerating art, * * *.

* * *

(Tr. 758:)

Q. (By Mr. Adams:) This specification points out that this vacuum faucet was intended to produce a vacuum as high as 29 inches? I call your attention to page 1, column 1, line 51.

A. That's correct.

Q. That's pretty high vacuum, isn't it?

A. That's correct.

Q. That is, the perfect vacuum would be what; 30 inches?

A. Close to 30 inches.

Q. Now you took up the Battersby patent. That's the British patent which is, I believe, 8 in the binder of patents. It is British patent 323,242. It's illustrated in the drawings, isn't it, as part of a soda fountain?

A. There are some inferences in the specification which could possibly lead to that statement, but I believe that the specification also states that that can be mounted at

(Tr. 759:)

the end of a faucet in a kitchen. May I read? It says it "can be attached to any domestic water tap for household use." That is found on page 3, column 2, lines 113 to 116. But there is the inference, on page 3, column 1, lines 14 to 18, that it could be mounted on a counter, so that might lead you to believe that was for a soda fountain.

Q. You have missed the real reference, which is just above that, page 3, column 1, which actually says that it is in a soda fountain?

A. That's correct.

• • •

(Tr. 760:)

Q. Now will you tell me what there is inside this apparatus which would finely divide the jet which issues from the orifice?

A. I would like to explain to you that what he says here is a little difficult to comprehend—you have to read the entire context of this specification, because he says here that "with the apparatus so far described." Now I believe at that point he hasn't yet disclosed the impingement stem, but in the entire apparatus as shown the impingement stem —I believe it's given the letter "u"—is part of the dividing means. At that point he says "with the apparatus so far described"—and then I am leaving some matters out—that you will get some finely divided water and air mixture which is highly aerated. Now there is some mixing taking place, because that jet, as it leaves the nozzle, starts to spread out a little. The greater portion goes centrally down and impinges on that impingement stem, but a portion of it will strike the inwardly sloping walls. Do you see that conical reduction of the pipe h which is shown in Figure 2. Now he could have meant that even if you left the stem out at that point, when he says "with the apparatus thus far described," he could have meant that the impingement of the water on these inward projections which are formed by that conical reduction could bring about the aeration of the water. That could have been what he meant, but I say, when you take this entire description as a whole, there are impingement surfaces in the conical reduction, there's the impingement surface on the peg u, and the entire device will bring about a—what's the word he used? He uses that the water will be highly aerated when it discharges.

Q. Now, actually, Battersby says nothing about these things you have just been talking about, does he?

A. Pardon.

Q. Does he say anything about impingement on the conical surfaces?

A. No, not about that.

• • •

(Tr. 764:)

Q. (By Mr. Adams:) You think that Battersby is going to give a stream which is anything like the stream you get out of the Aghnides device?

A. I didn't say that.

Q. Well, do you think so?

A. I don't know.

• • •

(Tr. 765:)

Q. What were you doing in 1929 when the Battersby patent issued?

A. What was I doing?

Q. Yes, sir.

(Tr. 766:)

A. Individually?

Q. Yes.

A. I probably was in school.

Q. In grammar school maybe?

A. I think you are right.

Q. And what were you doing when Mr. Aghnides made his invention in 1936? You were in high school probably?

A. Probably; I think I was.

Q. Now let's look at this anti-splash device of Battersby for a minute. What splash does that device prevent?

A. I don't quite follow your question. I will try to answer it. He just says that the lower end of Battersby may be fitted with any form of anti-splash device. He does not show the details of the anti-splash device.

• • •

(Tr. 768:)

Q. (By Mr. Adams:) Certainly you agree that if you

are going to put an anti-splash device on there you are not going to put one on that changes the announced intention of Battersby?

A. No, sir.

Q. Look down there on page 3, line 100, which says:

> "The blending, atomizing and aeration of the liquids is intensified by the jet stream impinging on the walls of the receptacle v"—that is the glass—"or on its contents or both, combined with the violent agitation set up in the receptacle v."

Did you ever see a soda-fountain squirter work?

A. Yes.

Q. And that is a good description of it, isn't it; it squirts down into the glass and stirs that all up into a froth, doesn't it?

A. I have seen that happen.

(Tr. 769:)

Q. You are not going to put an anti-splash device on, that prevents that, are you?

A. But he says an anti-splash device at the lower end.

Q. So you reason about it that it can be any anti-splash device, as a matter of words?

A. That is what he says.

Q. Now the anti-splash devices that he does show is one that is ideally shaped to prevent the very kind of splashing that would result from squirting a jet down into a glass, isn't it?

A. It could be used for that.

* * *

(Tr. 771:)

Q. (By Mr. Adams:) Well, is it still your position, do you want to convey the idea, that the stream coming out

of Battersby is anything like the stream coming out of Aghnides?

A. I didn't say that.

Q. You don't mean to convey that?

A. I didn't say that.

Q. Do you mean to convey that idea?

A. No. I told you what Battersby teaches.

• • •

(Tr. 773:)

Q. (By Mr. Adams:) You know that in this case Mr. Aghnides is talking about putting in sufficient resistance to break up the water, form a bubbly stream and make it coherent; isn't that what we are talking about, about resistance in the path of the jet?

• • •

(Tr. 774:)

A. That's one of the resistances.

Q. Is this peg the kind of thing that will give that kind of resistance?

A. Yes, sir. I should say it this way: It is an impingement body upon which, if jets impinge, you can arrange impingement bodies in such a manner as to achieve that result, any result you want to get.

Q. You came into this art, Mr. Lettvin, long after Mr. Aghnides had taught all this to the public, didn't you?

A. I don't know what you mean by that. I didn't make any investigation before he filed his first application, if that's what you mean.

Q. What investigations, actually, have you made since?

A. I have made investigations which have resulted in the materials I have referred to.

Q. You have gotten the best material together you could find to show that the Aghnides patent was invalid, haven't you?

A. I got the best material together I could find which would show the disclosure of resistance members for breaking up water and air to produce an aerated stream.

Q. You say your knowledge of the water aerator art is as a patent attorney. When did you begin, as a patent attorney, to work in the water aerator art?

(Tr. 775:)

A. In this specific arrangement?

Q. I'm not talking about Battersby; I'm talking about the subject-matter.

A. The first search I ever made in water aerators, I believe, was in 1951.

Q. For the Melard Manufacturing Company, wasn't it?

A. I believe so.

Q. You are their patent counsel?

Q. Yes, sir.

Q. Now, if you will, please consider the Solomon patent. Maybe you don't have to look at the patent itself. That is item 10. In Figures 7 and 8 there is shown a form of the device in which there is a spring-held valve member, and in your testimony, at page 690, I understood you were criticizing the model produced by Mr. Aghnides on the ground that his model had too much spring tension in that valve. Is it your position that the spring tension makes the device inoperative?

A. I don't follow you at all on that.

Q. Well, does it make any difference whether you have more or less spring tension at that point so long as the spring tension is weak enough to let the valve open and let the water come through?

A. It may.

(Tr. 776:)

Q. Now what difference would it make?

A. It's hard to predict.

Q. You don't know?

A. It's hard to predict.

Q. You don't know whether more, or less, or anything about it, really?

A. Well, it would require an extensive analysis.

Q. Now turn to the Felten patent. That is number 6 in the binder. You were here when it was demonstrated that, with the Aghnides aerator, the amount of vacuum that was created, measured by attaching a vacuum gauge to the air-ports, was about one inch, and with the defendant's structure it was no measurable amount, but with Felten there was about twenty-five inches of vacuum produced. Do you recall that?

A. I recall that, yes.

Q. Will you tell me what there was in the Felten device, and not in the Aghnides or defendant's device, that produced this high vacuum?

A. The ratio of the water inlet above the air-entrainment point to the size of the mixing chamber below, because, as I recall, when, in the first test, the mixing chamber below the air inlet was substantially the same size as the air inlet (Tr. 777:)

above—I'm sorry, the water inlet above where the air was entrained; and then, when the second model was brought in, more in conformity with this Felten patent, that is, with a larger mixing chamber where the water and air mixed and passed through, then the vacuum went down; and if that ratio was changed even further, that is, if it was desired to get less vacuum, all one would have to do is merely enlarge that mixing chamber and you would get less vacuum—and that, I think, answers your question.

Q. Now you still haven't answered the question, because I asked you what there is in the Felten patent that produced the vacuum.

A. Well, in the models that you produced, it was the ratio of the inlet water orifice to the mixing chamber and mixing passage where the water and air passed, and that ratio was kept at one to one in the first model and you have got one degree of vacuum, and when it went to one to something else, a little higher, you got less vacuum.

Q. How much less; do you remember?

A. I believe it was a half-inch to an inch of mercury, which represents a four per cent change.

Q. Instead of getting a 25-inch vacuum, we got a (Tr. 778:)
24½-inch vacuum, both of which are very high vacuums and very difficult to attain, aren't they?

A. They are higher vacuums—they are relatively high.

Q. They are very high?

A. I would say relatively high.

Q. Whereas one inch and no inches are insignificant vacuums, aren't they?

A. That is relatively insignificant.

Q. Now I ask you what is it in Felten that produced this difference.

A. I told you.

Q. You say it is a ratio or something?

A. That's correct.

Q. Now do you remember the test where we had the same ratio you are talking about, but the chamber was not flooded, and that we got no vacuum then? A. Yes.

Q. So wouldn't you draw the conclusion that it is due to the flooding of the chamber?

A. No. There was air leaking up through the outlet end, but that is not necessarily the result of flooding of the chamber. That may be an additional result that is obtained, but the purpose of Felten is to mix water and ozone-containing air. It may be an incidental feature that vacuum

(Tr. 779:)
is obtained, or a relatively higher vacuum is obtained, by the structural device shown, but the tests of Mr. Aghnides showed that if you want to get less vacuum all you do is change the ratio of the water-inlet size to the passage below the air inlet. The tests show that just by changing that ratio you can get varying degrees of vacuum, but that isn't the point; the point is that Felten is a water and gas mixing device.

Q. Now isn't it a fact that if that chamber weren't flooded and if the device did not have elements that resulted in flooding that chamber, you wouldn't get the vacuum, would you?

A. That is one of the features that may contribute.

Q. Well, it is a fact, isn't it?

A. That is one of the features that contributes. I said the ratio of the water inlet to the mixing chamber is the other feature.

Q. In other words, you are saying that you can change this chamber of Felten in such a way that you don't have a vacuum device any more?

A. I didn't say that. I don't think you have a vacuum device here. You have a water and ozone-containing air mixing device in Felten.

Q. We demonstrated it was a vacuum device, didn't we?
(Tr. 780:)

A. That happened to be an auxiliary effect.

Q. Doesn't he say that he has to have a vacuum device to work his valve and switch?

A. He utilizes vacuum that is produced by the device, as shown in Fuss, for the actuation of the switch.

Q. Now, doesn't he also say that his suction effect is produced by the conically widening chamber e—and I direct your attention to his own language on page 1 of the specification, line 28, where he refers to "conically widen-

ing chamber e, the widening of which produces in a well known manner the suction of the gas from the perforation d owing to the flow of the liquid from the perforation c into the widened chamber e."

Now isn't he there saying that he has made use of a principle of widening a narrow throat into a wider chamber and filling it with liquid and flowing the liquid through it, which thereby sucks the gas down; isn't that what he's there saying?

A. In a way.

Q. What do you mean by "in a way"? Is he or isn't he?

A. He is using the Venturi Principle to suck in gas, the well-known Venturi Principle.

Q. And that depends upon the fact this is a widened (Tr. 781:)

throat there at the top; it widens and it's full of liquid?

A. That's exactly what the Venturi Tube is.

Q. And that is what he uses?

A. Yes, sir.

* * *

(Tr. 803:)

ELIE P. AGHNIDES, being recalled, testified further as follows:

Direct Examination by Mr. Adams:

(Tr. 804:)

Q. (By Mr. Adams:) Now will you develop for me the circumstances of entering into that license? When did you first come to this country?

A. In 1937, in June; and tried for many months to find a suitable manufacturer to make my aerators under my

patents and, after approaching several firms, I approached the Chicago Faucet Company and, after a few days talking and demonstrating and explaining, we had an agreement (Tr. 805:)
signed on December 2, 1937.

Q. Prior to that time had your devices been manufactured abroad?

A. Rubber-made ones.

Q. Did you bring a sample of that with you?

A. I did.

> Mr. Adams: I have here a device which I would like to have marked for identification, as Plaintiff's Exhibit No. 65. I show it to you, Mr. Aghnides, and ask you whether you can tell me what it is.

A. This is a water aerator made by my French licensees. The French license was granted in 1936, and then I came to this country in 1937 and I brought this with me, and this device contains, this aerator made by my French licensee in 1937, or earlier, contains a restricted orifice, which is obtained by means of a metal tube inserted a little above the diaphragm, which gives the jets of high velocity.

* * *

Q. (By Mr. Adams:) Does that aerator embody the means of both your first patent and your second patent? (Tr. 806:)

A. It did.

Q. Can you, for convenience of the record, read off the labels that appear, or the names that appear, on this aerator. It's so old it's hard to read them.

A. Yes, I have a magnifying glass, which shows it's marked Aghnides License—

Q. Read the actual words at that point, will you? Does it say "Aghnides License"?

A. Yes, it says—will you please read this for me? I'm afraid my eyes are becoming—

> The Court: Let me see if I can read it. I think it says "Licensee" and then the word "Aghnides" and "lice"—I don't know what that means.
>
> The Witness: Yes, "Licence Aghnides", it says.

* * *

(Tr. 810:)

Q. (By Mr. Adams:) I have here, Mr. Aghnides, a blueprint which is entitled at its head "OXY-JET" and then has certain disclosures. Will you tell me what that is?

A. This is the cross-section—

Q. What is the piece of paper?

A. This is a blueprint which I sent to my licensee in 1936, covered with my signature and covered with the date of November 21, 1936.

> (Tr. 811:)
>
> The Court: It's a blueprint giving a cross-section of the device covered by this license agreement you are talking about now?
>
> The Witness: Exactly, your Honor.
>
> Mr. Adams: May I offer this as Exhibit 67?
>
> (The blueprint referred to was received in evidence as Plaintiff's Exhibit 67.)
>
> The Witness: Now this blueprint shows a cross-section of the "OXY-JET" made under license by this French firm, and in this cross-section we clearly see a restricted orifice, which is created by the restriction, a metal tube bearing number 3.

Q. (By Mr. Adams:) What is that item, number 3?

A. A metal tube, I said, number 3, which is effecting a restriction of the orifice above the diaphragm. This is the diaphragm, number 4, and the tube, number 3, is a restriction added there.

Q. Is that also shown as a separate part in a separate box on the drawing?

A. Yes, the dimensions of that metal tube are given in a separate box. The box bears also number 3, to identify the reference number 3 of the cross-section.

Q. I notice that in ink this blueprint bears the inscription "Bruxelles, le 21/11/36," and then what appears to (Tr. 812:)
be a signature. Can you tell me what that is?

A. That is my signature, "Aghnides."

The Court: What is this over here?

The Witness: Brussels. "Bruxelles" is the French way of saying Brussels. Then we have the date, which indicates the 21st of November, 1936.

Q. Were you then living in Brussels?

A. Yes.

Q. Did you put the inscription on there?

A. Yes.

Q. When?

A. At the time I sent it to them. The date shows when I sent it to them.

Q. In other words, you put it on there November the 21st of 1936?

A. Exactly; and this is my signature, "Aghnides" (spelling).

* * *

(Tr. 813:)

Q. (By Mr. Adams:) I want to ask you, if this is a blueprint you sent to your licensee, how does it come to be in your possession?

A. Well, I wrote a letter to them and asked if they had the drawing showing the inner parts of the aerator they built under my license, and they were kind enough to send it to me.

Q. I show you a carbon copy of a letter dated October 21, 1955. Can you tell me what that is?

A. This is the French copy of the letter I sent to this firm, the French licensee, requesting them to send me any documents they have referring to the aerator they built under license.

Q. And attached to it is the translation?

A. Yes.

Q. Now I show you a letter on the letterhead of Pierre P. Zecchini, the French company, dated 7 November, 1955, and ask you to tell me what that is.

A. This is their reply, telling that they are sending this document they found and some other documents.

The Court: Have you got the English translation on the back of it?

The Witness: Yes, here we have the English translation.

(Tr. 814:)

Mr. Adams: May I offer these two letters as Exhibits 68 and 68-A, for one, and 69 and 69-A for the other?

• • •

(Tr. 815:)

Q. (By Mr. Adams:) You stated, Mr. Aghnides, that when you came to this country in 1937 you brought with you this particular Oxy-Jet, Exhibit 65?

A. I did.

Q. Does that contain the same subject-matter as this blueprint, Exhibit 67?

A. It did.

Q. And did you disclose this aerator to the Chicago Faucet Company in connection with your negotiations for the license?

A. Yes, I did.

Q. With whom did you deal?

A. I dealt with Mr. Brown, Senior, who was president of the company.

Q. Is he now living?

A. No, he died a few years ago.

Q. Will you tell me something about your disclosure of this to Mr. Brown? Had he been in the aerator business previously?

(Tr. 816:)

A. No, he had not.

Q. Was this something new to him?

A. That's right. He was interested in it.

Q. What did you do with him to explain it to him and explain its structure?

A. Well, I had to explain to him how it functioned and which are the parts, because he had to know, first, what it does, in order to be interested, and, second, he had to know what it takes to build it. So I took apart the aerator, this one, and I had also a metal-made one, and I took that apart and demonstrated both and gave him all the information about the principle and the structure and the results. That is how he got interested.

Q. Where did you do this with Mr. Brown?

A. In his office there. There was a faucet in the office of Mr. Brown and I did it there, my demonstration.

Q. After you consummated your license with Mr. Brown in December, did you work with Mr. Brown on the design of your aerator?

A. Yes, because they had to comply with the requirement of the agreement, which is that the aerator must be approved by me, must be according to my drawings and it must be approved by me.

Q. What did you do in working with Mr. Brown on the
(Tr. 817:)
design?

A. Well, it was agreed, since we had agreed in the license—

Q. I have here Exhibit 9, which is the license to Chicago Faucet Company, Defendant's Exhibit 9—

Mr. Freeman: Those are the ones we offered and then withdrew them, and we are now presenting photostats.

Q. (Continuing) I find in his agreement, paragraph 4, the following:

"The device will be manufactured according to your plans or after the approval of plans submitted by us. It will not be modified without comm. agreement."

Is that the provision to which you just referred?

A. That's right.

Q. Did you work with him on various plans for designing it one way or another?

A. Yes. I supplied to them all the information concerning aerators, because it was agreed in the contract, and subsequently they complied to the letter with the agreement, and they sent me a sample for approval when they thought it was one dimension, or whatever they thought would fit exactly the faucet they wanted it to fit.

* * *

(Tr. 819:)

Q. (By Mr. Adams:) Now this license agreement, Exhibit 9, also states in paragraph 3, on page 2: "We will send you duplicates of all data or documents relative to

(Tr. 820:)
the advertising, manufacture or sale of faucets with this device." I think something was said in the Chicago depositions about having sent you an advance copy of an advertisement, which was then marked as Defendant's Exhibit 19. Was that sent to you and did you receive it?

A. Yes. The company complied with the contract faithfully.

Q. And did you write the letter which was then marked Exhibit 34, acknowledging it?

A. Yes.

Q. Now you said that the company eventually sent you a sample of what they were going to manufacture. Did you have any correspondence with them in order to get them to send that to you?

A. Yes, I had correspondence.

Q. I show you letters dated December 28, 1937; January 26, 1938; February 14, 1938; March 23, 1938; March 31, 1938; April 14, 1938; and April 30, 1938, and ask you to identify them and tell me what they have to do with this matter of furnishing you with samples.

A. Yes, on December 28, 1937, I was writing to the Chicago Faucet Company—I wrote to them stating—

The Court: The letter is the best evidence of
(Tr. 821:)
what you wrote.

The Witness: Yes, the last paragraph.

The Court: Read the last paragraph.

The Witness: (Reading.)

"I am anxious to be kept posted with the development of the license you have taken and to receive a faucet embodying the device as you intend manufacturing, so that I may transmit my suggestions, in our mutual interest."

Now in the letter I sent to Chicago Faucet Company on January 26, 1938, page 2, I stated:

"I should be very glad to receive your definite sample as, owing to my long experience, I can immediately tell you if the result obtained is perfect or it can be improved."

Then in this letter which is dated February 14, 1938—apparently it is a mistake; it must have been March 14th, because I am acknowledging letters from the Chicago Faucet Company dated February 17th, so this letter I am referring to is dated February 14th, but apparently should be March 14, 1938.

Mr. Freeman: We can agree to that, your Honor.

The Court: That's perfectly obvious.

The Witness: In the last paragraph I said:

"I am looking forward to receive your 'softflo' faucet which I hope will really be revolutionary."

(Tr. 822:)

The Court: The stamped receipt of it by the Chicago Faucet shows March 22, 1938.

The Witness: Then in the following letter from the Chicago Faucet Company to me, dated March 23, 1938, it is stated:

"With reference to the sample, will it be satisfactory if we send you simply the Softflo spout attachment or do you want a complete faucet?"

So I still didn't have it. In the following letter, dated March 31, 1938, I stated:

"With regard to my return to the United States, I shall be equally pleased to see you again and I shall proceed to your nice country as soon as I shall have organized the principal European markets. This is

one of the reasons for which I am impatient to receive your samples and those of my other licencees."

Mr. Freeman: Would you read the P.S. on that letter?

The Witness: Yes, the postscript:

"Please oblige sending me a copy of the magazine in which your Softflo ad has been issued."

Then in the following letter from the Chicago Faucet Company to me, dated April 14, 1938, it is stated:

"We note that you desire a complete faucet with the Softflo attachment. We are, therefore, pleased to send this to you. In case you wish to put this on for (Tr. 823:)
demonstrating purposes, we are sending you our No. 332 Wall Faucet for cold water only, as we believe you will be able to install this more readily and more generally than a double sink faucet."

In the letter from me to the Chicago Faucet Company, dated April 30, 1938, I stated:

"I am looking forward with interest to receive the faucet you kindly sent me and for which I thank you."

The Court: He's read the parts he's interested in. Is there any use putting those letters in; do you see any use offering them as exhibits? You may do so, or, by mutual consent—

Mr. Freeman: That's all right.

Mr. Adams: I'd just as leave put them in as one exhibit. Does the other side concede—

Mr. Freeman: He's read all I'm interested in.

Mr. Adams: There is one other thing I'd like to have on that same subject. Mr. Freeman might

stipulate. This is a document taken from the records of the Chicago Faucet Company—

Mr. Freeman: I have no objection to any of their documents.

* * *

(Tr. 825:)

AFTERNOON SESSION

Mr. Adams: There is one matter on the preceding examination I would like to clear up, because during the noon recess I glanced at this deposition of Mr. Aghnides that Mr. Freeman put in, on pages 50 and 51—

The Court: He introduced the entire deposition. He only read certain parts.

Mr. Adams: Yes; and on those pages it seems to me he referred to some models that were not put in evidence and it makes the deposition a little unclear not to know what was being talked about; and at that point, as I understand it, they were talking about models made by another licensee, the Acushnet Company, and the question was was the device that they made substantially in accordance with Plaintiff's Exhibit 14 of the Chicago lawsuit.

Mr. Aghnides said: "Is that what you are holding in your hand?" The question was "Yes," and the answer was "No, the first ones were slightly different. The second patent, which is restricted orifice, was not incorporated . . ."

ELIE P. AGHNIDES, resumed the stand and testified further as follows:

Direct Examination (Cont'd) by Mr. Adams:

Q. I have here two devices which I had better hand you (Tr. 826:)
at the same time and let you explain what they are and what relation they have to that testimony I just read.

A. The one I am holding now in my hand, which is brownish or beige colored—

Mr. Adams: Maybe we'd better mark it right now, so we will have a number for it. It is Plaintiff's Exhibit 72; and the other one, which is the red-and-black one, I offer as Exhibit 73.

(The two models referred to were received in evidence as Plaintiff's Exhibit 72 and 73.)

The Witness: Exhibit 72 is the first type aerator made by the Acushnet Process Company. Now when I signed an agreement with them in the fall of 1937 I supplied all the information and left them a sample of my French-made Oxy-Jet aerator, which name was carried on on this aerator. Now if we compare the French-made aerator and this we shall see that the design—

Q. The French-made aerator being Exhibit 65?

A. Yes, Exhibit 65 and Exhibit 72 are the same design, only the American-made is smaller so that it would leave more space below the aerator in the sink. Now when Acushnet made this aerator of Exhibit 72 the question of putting that metal ring was considered, and the extra expense—

(Tr. 827:)

Mr. Freeman: I object to his testimony as to what was considered by the Aeushnet people.

The Court: If he participated in it he can tell it.

Mr. Freeman: If he tells us who did the talking. He says it was considered.

The Witness: Yes, between us, the President, Mr. Phillip Young.

Q. (By Mr. Adams:) Did you participate in it? What do you know about it personally?

A. Yes, we discussed, and he said he wanted to make it smaller, a much smaller aerator.

Mr. Freeman: As to what was said, we object.

The Court: Is that part of the discussion between you and him as to what was to be done?

The Witness: Yes.

The Court: I think it's competent. I will give you an exception.

The Witness: He said he had two reasons for asking me not to insist for not putting in a metal ring, as was the case in the French-made Oxy-Jet, and those reasons were, one, the extra cost; and, two, it would shorten the connecting part, which was already a little shortened in connection with the French aerators. Then, later on, when I devised a way of making a small inlet orifice, according to

(Tr. 828:)

my second patent, as shown in Exhibit 73, and which did not require a metal ring, the company at that time incorporated in the new models they made the teaching of the second patent, the restricted orifice.

The Court: That's got Aghnides Patent 2,071,780 on it.

The Witness: It may refer to the tap connector, I don't know, the rubber part, the connector part.

The Court: I want to get straightened out on this patent 2,071,780. We haven't had that number, have we?

Mr. Freeman: That is not involved in this suit.

Mr. Adams: Not involved here; and this, as I understand it, was made before the patents in suit issued.

The Court: The bottom part refers to a patent in Canada in 1936.

The Witness: Yes, they asked me if they could export some, and the patent requirements in Canada required markings, and they were allowed to do that.

Q. (By Mr. Adams:) In this second form of the Acushnet device, Exhibit 73, what is the restricted orifice made of?

A. It is made out of rubber molded simultaneously when the whole connecting part was being made, so that there was no extra expense, and it did not take much space, because it is only three millimeters high.

(Tr. 829:)

Q. Did that accomplish the same thing as the metal insert in the French device, Exhibit 65?

A. It did. That restriction prevented—

Q. Can you see that restricted orifice any better by taking the device apart than by looking down from the top of it?

A. You can see better from the top, in this respect, that you can see it has been purposely restricted. From the other end you can see only the restriction. If you would like I will take it off.

The Court: It's not necessary.

Mr. Adams: Now, your Honor, I would like to demonstrate the Battersby device which the other side have talked about in their case, and I would like to ask Mr. Aghnides to proceed to the demonstration tank and produce a model of the Battersby patent, if he has it.

The Court: Battersby is number 8, isn't it?

Mr. Adams: I would like to offer that model and have it marked Plaintiff's Exhibit 74.

* * *

(Tr. 830:)

Mr. Adams: Also, while this is being attached, I would like to offer an enlarged photostat of the Battersby drawing, which, I understand, is a two-times enlargement.

The Witness: Two-times enlargement of the book drawing.

The Court: What number are you going to give that?

Mr. Adams: Seventy-five.

(The photostat referred to was received in evidence as Plaintiff's Exhibit 75.)

The Witness: Now I have built the Battersby device twice the size of Figure 2, in other words, four times the size of Figure 1, because I measured the glass below to see the proportions of the device, and, the glasses used in soda fountains being about a little more than four times bigger than the glass shown, I built this model for demonstration of the Battersby patent four times bigger than Figure 1; and another reason is that, by increasing the dimensions to the ones specified, it just fitted the spout end of a faucet adapted to receive aerators.

Now the Battersby device has a provision of a small orifice, which gives a very sharp stream. That (Tr. 831:)
orifice is specified as m in the patent. Battersby states in his patent that the water going through that orifice is subdivided in that orifice m, and he considers that a subdivided stream is an aerated stream, as stated in his patent. Now below the orifice m we have a screw which can be screwed inward or outward, and Battersby calls that screw as a flow adjuster—

Q. Labeled "u" in the drawing?

A. Yes—as a flow adjuster, and he states that when another liquid is entering the device through the lateral pipe o, then the flow of the blending liquid will be adjusted and the very sharp jet will penetrate it and break it up. As I understand it, this flow adjuster is provided by Battersby to slow down the flow of the blending liquid so that the sharp jet from the orifice m penetrates it and breaks it up. Now Battersby also states that he has at the foot of the device a special shape, which is to prevent splashing. He says that the outlet end of his device is so shaped as to prevent the splashing, and the drawing in the patent Figure 1 shows that the umbrella-like attachment covers the greatest part of the opening of the glass.

Q. Labeled "t"?

(Tr. 832:)

A. Yes. Now Battersby states that the water going through the orifice m, which he calls the aerated jet, is further aerated when that jet strikes the bottom of a glass or the sidewalls of a glass and creates a violent agitation or turbulence. He refers to the orifice m and says in which the water is subdivided into an aerated jet.

Now, if we demonstrate this device, we shall find out how it performs. (Demonstrates with device on faucet and water running.) Now, as one can clearly see, we have an incoherent, harsh stream of water containing no bubbles whatsoever. Even when the screw is screwed on as tight as it will go, so that it presents the maximum resistance, even at that point the stream issuing is a very harsh, splashing stream and which creates bubbles on the surface of the water drawn into a glass, but it is a harsh, divergent stream.

Now it is very interesting to see that only a fraction of the energy of the water has been used in the device, because we practically find most of the energy of the water in the issuing stream, because the stream issuing from Battersby is even harsher than the ordinary stream from a faucet.

So Battersby has a certain purpose, very clearly described in his patent. He wants to create a very sharp (Tr. 833:)
jet, and he effects some aeration in the bottom of a glass of that sharp jet, which he considers aerated water.

Now we have a mode of operation entirely different in this device because, as one can see, the jet from the orifice m breaks before getting out and we find it in a broken-up state without having undergone that operation which my device performs and which is imprisoning the air into the mass of the water. It's an entirely different situation here, where particles, or strips, or layers of water are surrounded by air, whereas, in a bubbly stream, bubbles are surrounded by water. It's entirely the reverse, reverse process, and we can clearly compare these two streams, the bubbly stream and the Battersby stream, so that there is nothing in between them.

Q. Will you state what you have done? You have mounted—

A. I have mounted on the next faucet, nearest to the one where we were demonstrating Battersby, a Velvet-Flo aerator, so that one can see—

The Court: What is the exhibit number of that Velva-Flo?

Mr. Hamilton: This isn't an exhibit.

The Court: It's like one, though, isn't it?

Mr. Hamilton: Yes, sir, it is exactly the same (Tr. 834:)
thing. It's Exhibit No. 31.

The Witness: (Demonstrating with the two devices.) Now we can see on the one side, where the areator is, we have a white, coherent, non-splash stream, and if one looks at the stream with a flashlight one can see the bubbles in suspension in that jet. Now on the other side we have the Battersby, which is clearly incoherent; the water is all broken up and the air is surrounding particles of water, or strips of water, or layers of water, and, as a result, all the energy of the water, most of the energy of the water, is still in the issuing stream and produces a high degree of splashing. This is like the Solomon device where we have—

The Court: In speaking of "this," what are you talking about?

The Witness: This is Battersby. This Battersby device has a stream inside which strikes a member, which is called the screw u in this case, which is comparable to the pegs used by Solomon, and likewise we have a highly splashing stream here, as we have shown with Solomon, and likewise, as Solomon himself states, when such a stream is projected into a glass the upper portion of the glass will have bubbles formed, but those bubbles are

formed by the violent agitation created by the issuing stream.
(Tr. 835:)

Now, fundamentally, this is very different from the aerator, where we have spent the energy of the water so that there is very little energy left to promote splashing, so no splashing takes place; and the second reason for which the bubbly stream doesn't splash is that in this new way of making a non-splash stream these bubbles cushion the impact. There is such a great amount of bubbles in the mass of the water that when that bubbly stream strikes an object it does not splash because, first of all, it does not have the jet velocity coming out of Battersby or Solomon, and, second, it doesn't splash because of the energy being transformed into bubbles and those bubbles cushion the impact. But the result, independently from my explanation, the result is there, a soft, bubbly stream; the bubbles are in the mass of water. The other is a harsh stream of water surrounded here and there by free air, which immediately spreads, and we don't have the benefit of softening the impact as we do with the bubbles.

Q. Now let me ask you this: In the Battersby patent, page 3, column 2, line 78, he speaks of a jet of aerated water from the nozzle m. Now what do you understand is meant by aerated water in that sense?

A. Well, as I understand it, Battersby aerates the water
(Tr. 836:)
by dividing it; in other words, by issuing it in the form of a thin jet and exposing it to the air in a long, long stem here, so that that jet coming out of the orifice m in Battersby really divides the mass of water into a thin,

sharp stream and only the air which fills the chamber in Battersby comes in contact with that thin stream of water, and you may say that water is to some extent exposed to air. And then he continues and says that this aeration of the bubbly stream—of the sharp jet—is made when that sharp jet strikes into the bottom or the walls of a glass to create a violent agitation.

Q. Let me ask you this: On the same page, column 1, line 51, it says "if this jet is received in a receptacle, the water would be highly aerated and would remain aerated for an appreciable time." Would you tell us what that means?

A. Well, precisely when the jet strikes the glass and produces all those bubbles, you have some aeration taking place, because, when the jet strikes the walls of the glass and the water which is in it, it creates a violent agitation, as Battersby himself explains, and that further aerates the stream, the jet coming from the orifice m, which, in his opinion, was aerated.

Now, in order to produce the effect that the sharp (Tr. 837:)

jet may strike the walls of the glass and create a violent agitation is the reason for which Battersby has selected a new form or shape of a non-splash arrangement. He put a skirt around the foot of the outlet of the device, so that he may maintain the velocity of his sharp jet issuing from the orifice m, because he's relying on that velocity to aerate the water that's drawn in the glass.

Now we have shown that when the screw is entirely in, so we have the maximum resistance, when we still have a highly splashing, incoherent stream, as apparently Battersby intended to use the screw in connection with flavoring liquid so that the sharp jet will break up the flavoring liquid, and it seems that when he intends to use it without any flavoring liquid, then the screw wouldn't have too

much of a function, but even if he wanted to use that screw—of course, it's there—we have shown that he doesn't get anything like the stream issuing from my device.

Mr. Adams: Now, your Honor, I would like to make just one more demonstration.

The Court: Do you care to ask him anything about that?

Mr. Freeman: Yes, sir, I do.

The Court: Before he takes it off, let him conduct (Tr. 838:)
his cross-examination. While he's got the device attached, defense counsel will be permitted to cross examine the witness with respect to this demonstration.

Mr. Freeman: Mr. Aghnides, what do you understand when the patentee, Battersby, states that the adjuster, when desired, may be moved outward or across the entire pipe h, so that the liquid stream will impinge upon the stem, which is causing the blended liquids to be discharged from the pipe h in a foaming state?

The Witness: I understand exactly what he says. In other words, when you put through a blending liquid and the jet strikes that blending liquid, not the pipe or screw, as you all know, syrupy liquid naturally will create a foam and froth and issue as two liquids, the blended liquids and some air and foam and froth.

Mr. Freeman: What do you understand when the patentee says that when plain drinking water is aerated the visible air bubbles soon disappear, although if aerated water is examined under a powerful lens the air is seen in suspension for some time afterwards?

The Witness: I shall tell you exactly what I understand, because it seems clear to me— (Witness demonstrates device on faucet.)

* * *

(Tr. 839:)

The Witness: Now when I draw aerated water, as Mr. Freeman asked me how I understand it, how those bubbles are formed, those bubbles are formed on the top of the glass by the violence of the stream hitting the glass.

Mr. Freeman: Is it your position that no air emits from the device with the water?

The Witness: No, not at all, but that air is not imprisoned in the mass of the water.

Mr. Freeman: Does air pass out of the discharge end of the Battersby device with the water?

The Witness: I would think it does.

Mr. Freeman: And in a mixed form, due to the impingement of the stream against the screw u, the screw which is lettered "u"?

The Witness: Well, we have seen to which degree that stream is mixed, and whatever I would say wouldn't change the situation. That mixture, so far from being coherent, was incoherent, harsh and violent.

Mr. Freeman: I am talking about plain drinking

(Tr. 840:)

water.

The Court: Go on with your demonstration about the plain drinking water.

The Witness: Yes, sir. (Demonstrating) Now these bubbles go away, and if we look with a magnifying glass in the water we can still see some tiny air—I think we can, your Honor, if you would like to look.

The Court: Let me have the glass.

The Witness: Maybe you can see the tiny little bubbles—that's what he's referring to—with the magnifying glass, in the drawn water.

Mr. Freeman: Now, Mr. Aghnides, you use the words "form of anti-splash device" to mean the single form shown in the Battersby patent; correct?

The Witness: Yes, because he specified the shape. He referred to the type of anti-splash he is using as being of a shape to prevent the splashing from the glass upwards, and then he states further that that form of anti-splash device he described could be of any form of anti-splash device, which clearly refers to the same concept of anti-splash, because otherwise the whole function of his device would be destroyed. He described that he must hit the bottom of the glass, he must create bubbles on the top of the glass, he must leave some minute particles (Tr. 841:)

of bubbles you can see with a magnifying glass. You can't do all those things if you change the operation of the device from the one that Battersby intended to have.

* * *

(Tr. 851:)

Q. (By Mr. Adams:) Is there anything said in this Vielliard patent about using the right number of screens or proportioning to secure a coherent aerated stream?

A. No. He shows no air inlets in the device.

* * *

(Tr. 853:)

Mr. Adams: I have here a copy of the Haisman patent, another British patent, 7,005, of 1913. I would like to have that marked.

The Court: Is that patent discussed in the Circuit Court's opinion?

Mr. Adams: I believe not, Your Honor.

The Court: What exhibit number will it take?

Mr. Adams: Number 76, I believe.

(The patent referred to was received in evidence as Plaintiff's Exhibit 76.)

Mr. Adams: At the same time we could mark the model of the Haisman patent, which the witness has produced, as 77. I may say, Your Honor, this patent was in the record in the Chicago case.

(The model referred to was received in evidence as Plaintiff's Exhibit 77.)

Q. (By Mr. Adams:) Would you, Mr. Aghnides, please explain the various parts of this model? First state is this made in accordance with the Haisman patent and the patent drawings.

A. It is. This device comprises a partition with six holes, six orifices, which deliver streamlets of high velocity. Downstream that partition there are openings.

Q. Is that the partition which in the patent is labeled 3? (Tr. 854:)

A. Yes—

Q. The partition is 2 and the holes are 3?

A. And the holes are 3.

The Witness: Downstream that partition, on the wall of the chamber there are orifices, shown by numeral 10, and in the path of the streamlets issuing from the partition there is a wire-mesh screen.

The Court: Numeral what?

The Witness: A wire-mesh screen, shown by numeral 6. In other words, we have here something like a diaphragm, orifices leading inside the chamber, and below those orifices we have a screen, which seems to look like an aerator. Now if we attach this on the faucet and operate it, we shall see the fundamental difference. (Witness demonstrates with device on faucet.) This device gives a divergent spray which is very harsh, which has no
(Tr. 855:)
bubbles. The water is surrounded by air, but there is no air in the mass of water; and Haisman has shown in his patent different screens, finer and coarser. I should like to show that, with any of the screens shown in the patent, the device operates and functions the same. (Witness demonstrates.) This is the third dimension given.

Q. You are now putting a third screen in in place of the second screen?

A. Yes. This is also an equally splashing, divergent stream.

Q. Now let me ask you did you demonstrate this device in the patent office?

A. Yes, I did.

(Tr. 856:)

Q. You referred a moment ago, I believe, to the possibility of showing that an ordinary anti-splash device which would operate satisfactorily on an ordinary stream of water would not necessarily operate properly on a divergent jet stream. Can you use this device to demonstrate that?

A. Yes. If we put on this screen of Haisman, one additional screen, so we have two screens, and attach it to Haisman, we still have a harsh, divergent, splashing

stream. Haisman states that this device should be operated under pressure of 40 pounds, but even at 30 we have a divergent, incoherent, splashing stream. Now if we take this unit which contains the two screens, which was unable to make coherent and non-splash the Haisman stream, and if we attach this unit with the two screens on a splashing faucet—

Q. Before you do that, would you explain what you have on the faucet to permit this attachment?

A. I have a connector, permitting the water of the faucet to go through the orifice of the connector, so that when we shall turn the water on and open this faucet where the connector is we shall see that we have a highly splashing ordinary stream.

(Tr. 857:)

Q. Will you first show the plain water coming out of the faucet?

A. (Demonstrating as requested.) Now here we have a greyish ordinary stream, which is a highly splashing stream.

Q. Does it look whitish?

A. It looks greyish, whitish, anything you wish, because the water is dispersed, highly splashing. If we attach the two screens, which weren't enough to make a coherent stream out of Haisman and eliminate splashing, we shall find that here, because we have no air, we have no stream accelerator in the faucet, the conditions being entirely different, we shall see that a non-splash device has been created which is good for the ordinary faucet, but which is not good for the jet from Haisman. (Witness demonstrates.)

Now here we have a perfectly non-splash stream created by those two screens, and yet, as we saw before that stream of the faucet without any attachment, it was a highly splashing stream. In other words, what is a

non-splash device for a faucet is not necessarily a non-splash device for an aerated stream of water; and whereas a non-splash device on a faucet does not change the mode of operation and the character of the stream except to elimi-
(Tr. 858:)
nate splashing, such as an addition, if it was proportioned according to my patent, would change the mode of operation and the results of those so-called aerators into an entirely new thing, which is being debated here, my aerator, but you may see from this simple test that it is not enough to just take one or two screens and put in a harsh jet or stream and make it non-splash; you have to proportion it.

Q. Is that same thing true if you were trying to convert Battersby into a coherent stream? A. Yes.

Q. And is it also true of Solomon? A. Yes, the same principle. You may put too much resistance, you may put too little resistance, and if you put just enough resistance, according to the principles of my invention, then in that case you are using the teachings of my patent in combining two existing patents to create the result produced by my invention.

Q. What is the fact; would it alter the mode of operation of Solomon if you were to add the proper number of screens to make a coherent, bubbly stream? A. Definitely.

* * *

(Tr. 864:)

Q. (By Mr. Freeman:) Do you recall when you were adversely examined that you said that the device with a restricted orifice wasn't made in Europe until about 1938?
(Tr. 865:)

A. I said I believed, I didn't remember exactly, and I had to go into all these papers—
(Tr. 866:)

Q. (By Mr. Freeman:) Now I call your attention to the

(Tr. 867:)
top of page 51, where you explained that the first ones were slightly different—and I am now quoting:

> "The second patent, which is restricted orifice, was not incorporated, and this connecting part, which is a different invention of mine, was also made in a different way."

Now did you intend by that to say that the restricted orifice was not then in use in the United States?

A. Well, as I say there, the first ones—of Acushnet I mean—were slightly different. Here we have Exhibit 72, which does not have the restricted orifice, and I say

> "which is restricted orifice, was not incorporated, and this connecting part, which is a different invention of mine, was also made in a different way."

What am I asked?

* * *

DEPOSITION OF EARLE E. BROWN

(Dep. Tr. 3:)

EARL E. BROWN, called as a witness by the defendant, having been first duly sworn, testified as follows:

* * *

(Dep. Tr. 26:)

Cross Examination by Mr. Hamilton:

Q. Now, when you made the adapter which is colored green in this drawing with the screen at the top and then you attached to it an aerator at the bottom, what was the

purpose of the screen in the top of the adapter in the combination of adapter and aerator?

A. I don't feel qualified to answer that, because I am not sure that I know. May I say that in the development (Dep. Tr. 27:)

of the aerator Mr. Aghnides came up with ideas, and my father, who was an expert mechanic, went out in the shop and worked them out, and it was a cut and dry deal. They would make it that way, and, well, that is not quite enough aeration, or it has a tendency to splash, or something, and then he would do it over again and make a change, and kept on making changes until finally Mr. Aghnides was satisfied with the result.

* * *

(Dep. Tr. 31:)

Cross Examination by Mr. Reddy:

Q. Mr. Brown, referring to Exhibit 19, the ad which you placed in Domestic Engineering, dated March, 1938, could you tell me whether or not your company made any sales of Softflo aerators prior to the insertion of that ad?

A. No, I could not be certain.

Q. Do you have any recollection at all?

A. No, I am sorry, I don't. We may have made an occasional sale to somebody that we were able to show the device to; but I don't suppose until we gave it publicity that we were able to sell very many.

Q. Do you have any independent recollection of how long after that ad was inserted that any sales, actual sales, were made by Chicago Faucet of the Softflo aerator?

A. Well, I think the sales started very slowly; in fact, I am sure of that, but we began to have sales in a small way, I should say, from that time on.

Mr. Freeman: March, 1938?
The Witness: Yes, sir.

By Mr. Reddy:

Q. As soon as the ad appeared?
(Dep. Tr. 32:)
A. Well, I should say so.
Q. You don't have any records with respect to that?
A. We have an informal type of record which Mr. Ganey kept. He is quite a man for detail and statistics, and he kept that information, and that is the only record that I know of that could be referred to.
Q. Then Mr. Ganey would be the best source of that information?
A. Yes, he would.

Mr. Reddy: That is all.

* * *

(Dep. Tr. 34:)

Re-cross Examination by Mr. Reddy:

Q. Referring to Exhibit 26, I note the first entry is dated January 19th, and further along on the page under "debit" is the sum $83. Now, that represents royalties due Aghnides, is that true?
A. Yes, sir.
Q. Does it represent royalties that were actually paid to him at that time?
A. I am not a bookkeeper, much less an accountant, but I should say that it represents royalties that accrued to him. Undoubtedly other records might be available that would show payments. I notice under this column "Folio, V. R.," which might mean voucher record, and various numbers listed.

Q. Under your arrangement with Mr. Aghnides, were you required to pay him a minimum royalty?

A. Yes.

(Dep. Tr. 35:)

Q. Does this figure represent that minimum royalty?

A. It does, Mr. Reddy, down to this point. I mean, that minimum royalty was to be $1,000 a year, and that figured out $83, and I guess some odd cents, per month.

Q. So that the figure 83 opposite the respective dates merely indicates your payments of minimum royalty and does not refer to royalties paid by reason of actual sales of the aerator?

A. That is correct.

Q. In other words, if you did not sell any aerators in January, you would still have paid Mr. Aghnides $83?

A. That is right.

Q. So that these royalty payments do not evidence sales of the aerators?

A. That is correct.

* * *

(Dep. Tr. 59:)

DEPOSITION OF HENRY A. THEED

HENRY A. THEED thereupon resumed the stand and testified further as follows:

Cross Examination by Mr. Hamilton:

* * *

(Dep. Tr. 62):

Q. (By Mr. Hamilton:) Now, what was the function of that screen in the adapter, the original adapter?

A. Well, in my opinion, it was there as a strainer.

Q. Did it have any effect on the operation of the aerator below?

A. I don't think any appreciable effect, no.

Q. When you changed from the present form with one diaphragm labeled 1-125 and added another diaphragm (Dep. Tr. 63:)
or disc 1-129, you kept the same screen up at the top of the areator. Did you keep it for the same purpose?

A. To the best of my knowledge, yes.

* * *

(Dep. Tr. 66:)

DEPOSITION OF DENIS P. GANEY

Re-direct Examination by Mr. Freeman:

Q. Do you recall about when the company, Chicago Faucet Company, first began to offer for sale Softflo aerators?

A. No.

Q. You have no independent recollection as to that?

A. No.

Q. Were they offered for sale at or about the time of the appearance of the ad that you have in your hand, Defendant's Exhibit 19?

A. I couldn't say.

Q. Now, as sales manager, can you tell me whether or not it was the custom of the company to advertise products for sale prior to the time that they had the products ready for sale?

A. The answer to that would be that we no doubt had it in such form that we would be able to fill orders shortly.

Q. So when the ads appeared of the kind that you have in your hand, Defendant's Exhibit 19, the company then had products on hand for filling orders received as a result of the advertisements, is that correct?

Deposition of Denis P. Ganey.

(Dep. Tr. 67:)

A. Possibly not finished product.

* * *

(Dep. Tr. 67:)

Q. (By Mr. Freeman:) Well, do you have any records of the actual sales, records that maybe you personally kept with respect to the sales of Softflo aerators?

A. I have only one record, which is in the book there of sales by items,—items which go back many years.

Q. Now, will you examine that record and tell us when, in accordance with the records that you have, which I understand is one of your personal records, first sales of Softflo aerators were made?

A. This is not a personal record.

Q. A record kept by you personally, then.

A. In part kept by me personally.

(Dep. Tr. 68:)

Q. Will you tell us when was the first sale or record of sale that you have?

A. The year 1938 records. We show No. 800 sales in May, 1938. The No. 800 was the designation for the Softflo with adapter.

Q. And I understand that in that month there were actually twenty units sold. A. That is recorded.

Q. In other words, you don't know whether those were sold on May 1st, May 10th or May 20th? A. No.

* * *

DEPOSITION OF ALFRED F. STRANG

(Dep. Tr. 84:)

ALFRED F. STRANG was called as a witness by the defendant, and having been first duly sworn, testified as follows:

Direct Examination by Mr. Freeman:

* * *

(Dep. Tr. 92:)

Q. (By Mr. Freeman:) Now, do you know who made the part No. 121, which is the adapter?

A. Well, that was made in our shop. We make parts like that out of brass rod.

Q. How about the making of the body part, 120?

A. The same thing.

Q. So that with the parts that were received or purchased from outside sources, that is, parts 122, 126, 123, 124 and 125, along with those parts that were made by your company, to-wit, part 1-121 and part 1-120, that made up the aerator and adapter, is that correct?

A. Yes, sir, that is correct.

Q. Do you have any recollection of seeing any adapter and aerator in an assembled condition very much as illustrated in Defendants' Exhibit 27; I mean, in an assembled

(Dep. Tr. 93:)

unit, including these parts that were brought into your plant some time in February of 1938?

A. I can't say that I remember them at this time, no. I remember seeing lots of them, but I wouldn't say that was at that time. I don't remember that.

Plaintiff's Exhibit 64.

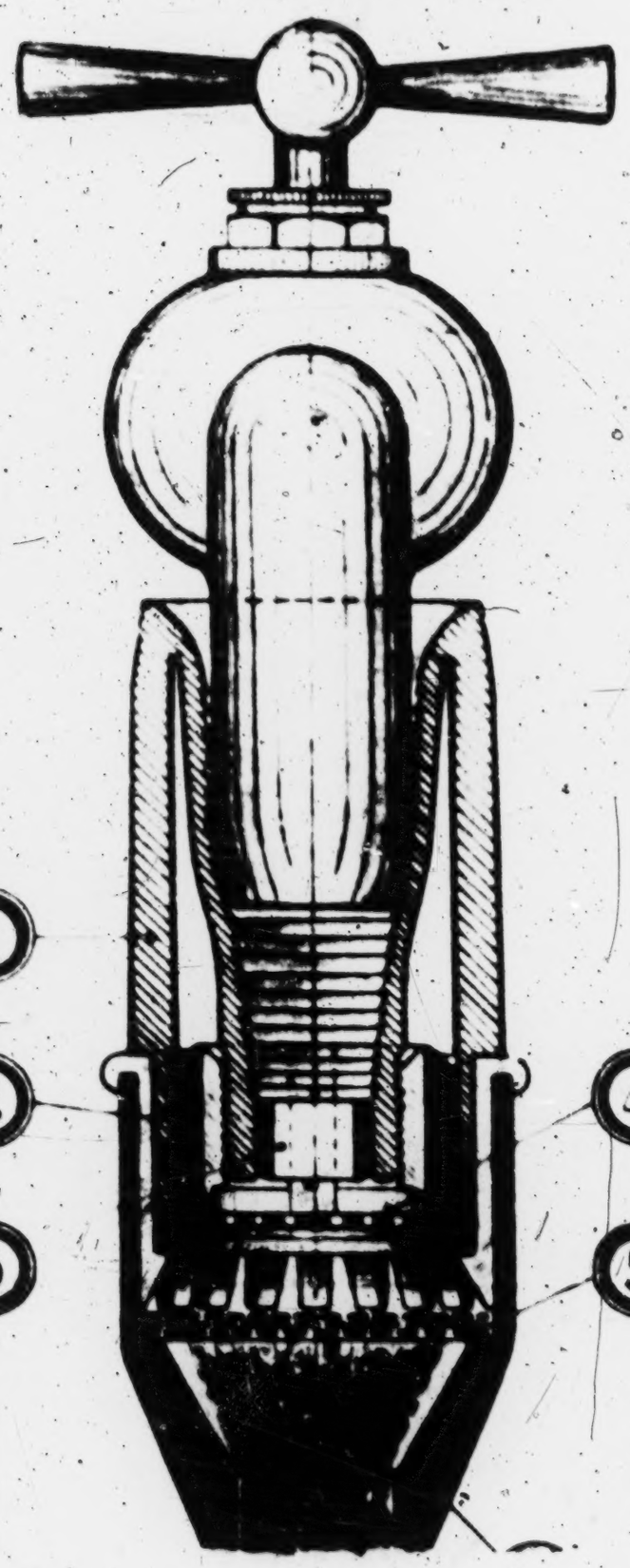
(See opposite ☞)

ITEM		JAN	FEB	MAR	APR	MAY	JUN	SEMI	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
#403	2	23	2	12	6	9	55		25	11	6	18	17	3	288
#405	7	1		0	2	1									11
#407	2	1													
#423	2	3	6	2	15	1	2	37	1	1	1	3	1	39	
#428	4														1
#429	7														
#425	12						3								3
#426	12														
#427	1	2					1								3
#428		2	5								1				8
#429	1					1			3						4
#430	7	1	1	1	8		1					1	1		14
#431	4			1		1							1		3
#432	4														
#434	4														
#435	4						1								2
#436	3														
#438	2														
#439	4														
#442	13	63	245	46	107	30	23		9	1		2			9
#443	7			6	1	2	1		1	1	9	1	1	1	717
#444	13	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	21
#446	13	1									1				[illegible]
#447	7	197	80	41	52	[illegible]	173		257	178	126	251	165	169	2262
#448	13												2	1	10
#452	2														
#453	5														

ITEM	JAN	FEB	MAR	APR	MAY	JUN	SEMI	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
783						1								1
784						1								1
793	2					44								46
797	7				1	103		3	19	44	40	41	104	361
795										44		3	23	
800					20	61		102	26	65	26	51	25	449
801												4		4

OXY-JET

VITALISEUR D'EAU



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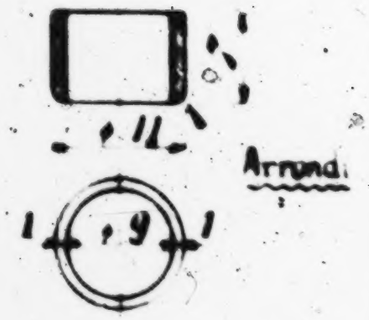

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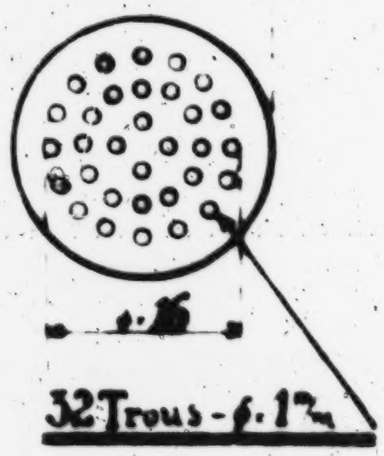
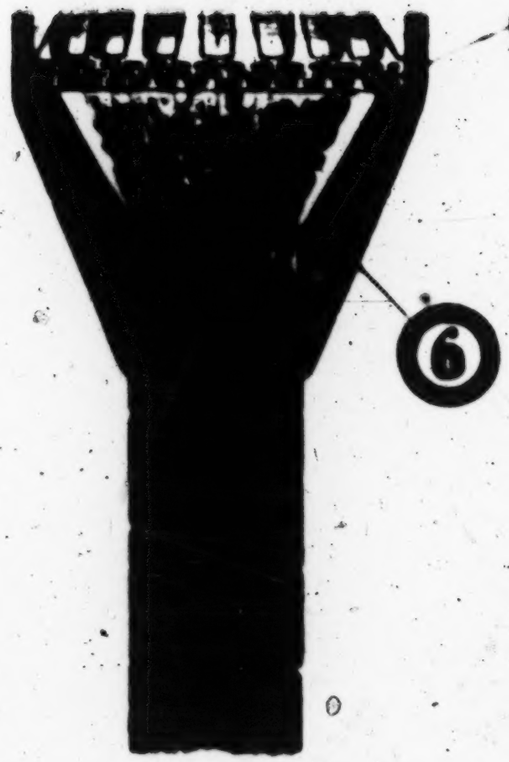


32 Trous - ø 1,2



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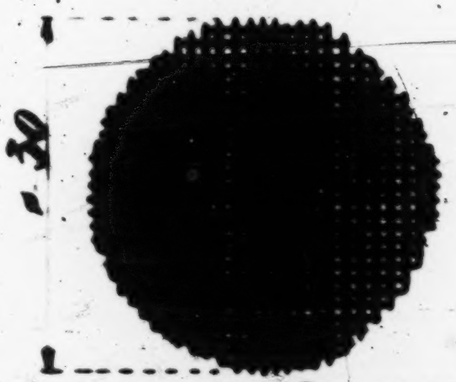
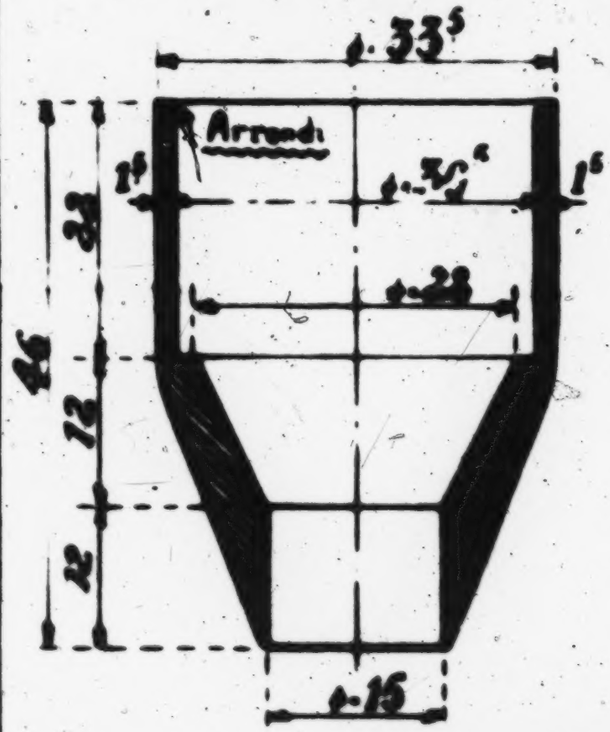


3 Tamis { Ep 0,5 m/m
Carré de 1 m/m

⑥



Dimensions en m/m
Echelle 1/1

E.P. AGHNIDES
14 Bd de Waterloo
Tel. 11.38.00

THE CHICAGO FAUCET CO.

2700 TO 2722 N. CRAWFORD AVENUE
TELEPHONE BELMONT 0301
CHICAGO

ORIGINAL INVOICE

4 14 8
DATE ENT'D | WANTED | PROMISED | ORDER No. | SHIPPED

WT. ADD 1 & 1/2 LB

SOLD TO

E.P. AGHN DES
14 BOULEVARD DE WATERLOO
BRUSSELS, BELGIUM

SHIPPED TO

SAME

ROUTE
SPL. MARK P.P.
Customer's Order No. ZONE

ROUTE
SPL. MARK
Customer's Order No. ZONE
SALESMAN

12M 3-30 1381 Coated Bond R. P.

TERMS: 5% 71

Net Cash 30 Days, 2 Per Cent 10 Days

SETTLEMENT MAY BE MADE BY ANY CHECK
PAYABLE AT PAR
Through Federal Reserve System

Freight allowance only as per our current price list.

Prices subject to change without notice.

Claims for shortage or defective material must be made within 15 days from date of invoice. Return packing slip with such claims.

DESCRIPTION	PLATE NO.	ITEM NO	QUANTITY	LIST	GROSS AMOUNT	NET AMOUNT
CHROMIUM PLATED SINGLE WALL FAUCET WITH SOFTFLO SPOUT END-4 5/8" LONG		332 800 CP		N/C		

IMPORTANT

NO STATEMENT WILL BE RENDERED THIS
FIRST OF EACH MONTH AS HERETOFORE
KEEP THIS INVOICE AND PAY IT ON THE
DUE DATE.

Plaintiff's Exhibit 67.

(See opposite ☞)

Plaintiff's Exhibit 71.

(See opposite ☞)

800

NAME & DESCRIPTION OF PART

800 SOFTFLO ASSEMBLY

NATURE OF CHANGE

Add 1 disc 1-129
1 gasket 1-130
1 screen 1-124
1 separator ring 1-126

REASON FOR CHANGE

To improve stream

ESTIMATED COST OF CHANGE

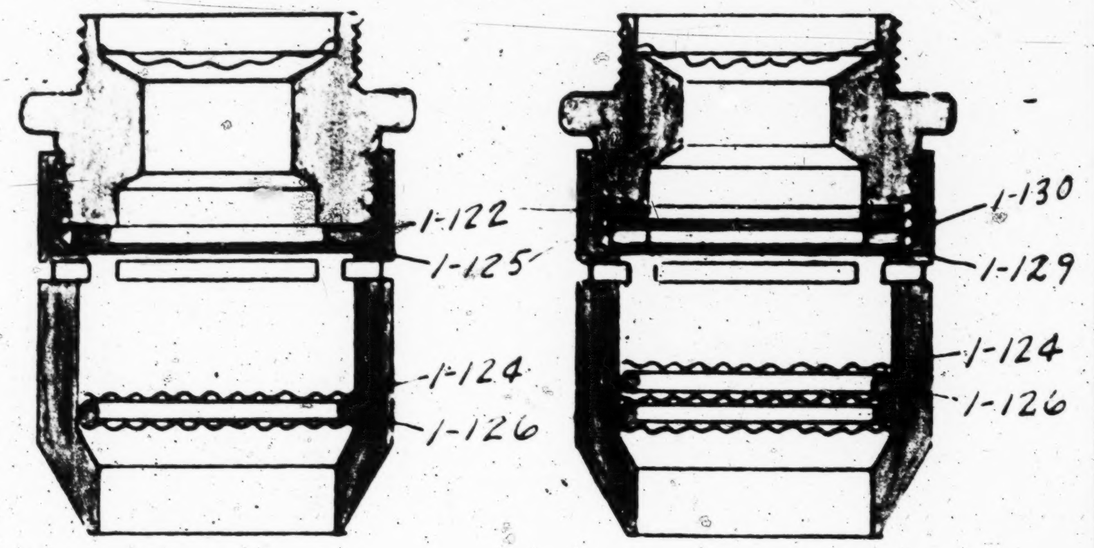
SEE C.O. 1-121-K

OTHER PARTS AFFECTED

1-121 See Change order

REMARKS -

CHANGE ORDER NO. 1
DATE 2-5-40
OLD PART NO. 800
OLD DRAWING NO. 800-A
NEW PART NO.
NEW DRAWING NO.
QUANTITY OF OLD PARTS ON HAND
EFFECTIVE DATE OF CHANGE



PRESENT PROPOSED

SCALE 2" = 1"

SUGGESTED BY H. Steen APPROVED BY ACB

DRAWINGS CHANGED BY H.A.T. MATERIAL SHEETS BY

Defendant's Exhibit 25

THE CHICAGO FAUCET COMPANY
2700 TO 2722 NORTH CRAWFORD AVENUE
CHICAGO

NAME & DESCRIPTION OF PART

Softflo Adapter

CHANGE ORDER NO. 2
DATE 10-27-47
OLD PART NO. 1-121
OLD DRAWING NO. 1291
NEW PART NO.
NEW DRAWING NO. A-1-121
QUANTITY OF OLD PARTS ON HAND
EFFECTIVE DATE OF CHANGE At once

NATURE OF CHANGE Discontinue use of screen #1-123 in adapter and eliminate counter bores of 1/2" dia. and .593 dia. aNd 3/8 dia. bore and use a single bore thru part of 17/32 dia.

REASON FOR CHANGE

Simplify and economize

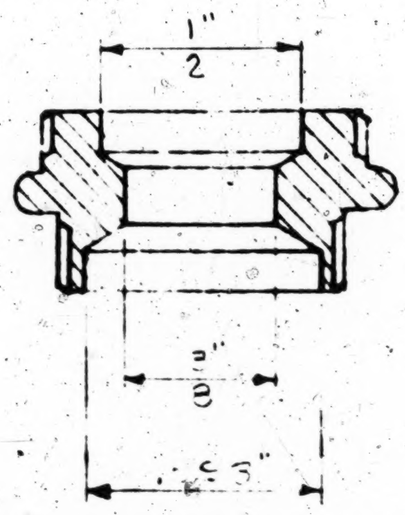
ESTIMATED COST OF CHANGE

No cost involved

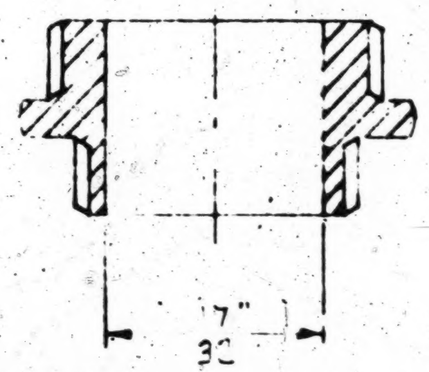
OTHER PARTS AFFECTED

None

REMARKS -



PRESENT



PROPOSED

SUGGESTED BY _____ APPROVED BY

DRAWINGS CHANGED BY F.J.B & H.T. MATERIAL SHEETS BY H. Theed

THE CHICAGO FAUCET COMPANY
2700 TO 2722 NORTH CRAWFORD AVENUE
CHICAGO

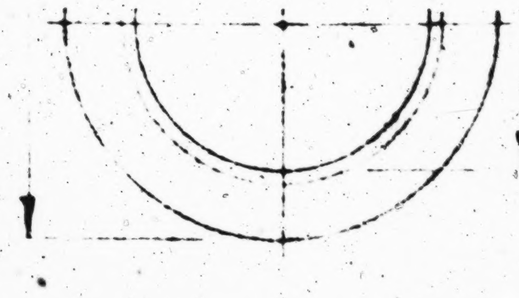
Defendant's Exhibit 30

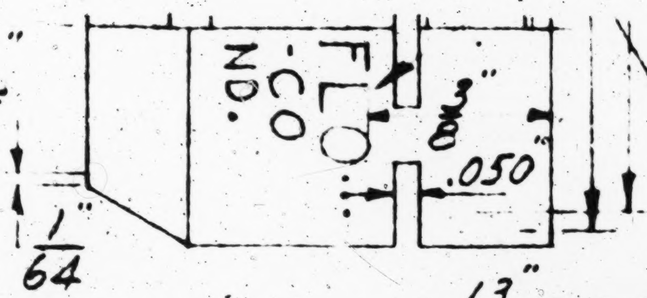
Defendant's Exhibit 25.

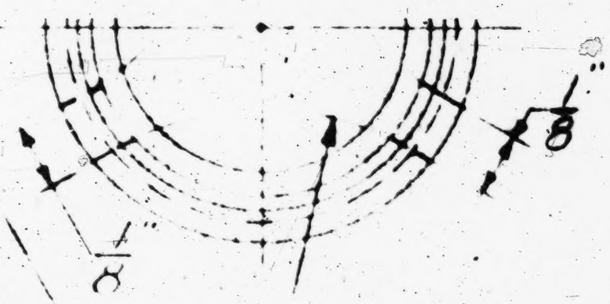
(See opposite ☞)

Defendant's Exhibit 30.

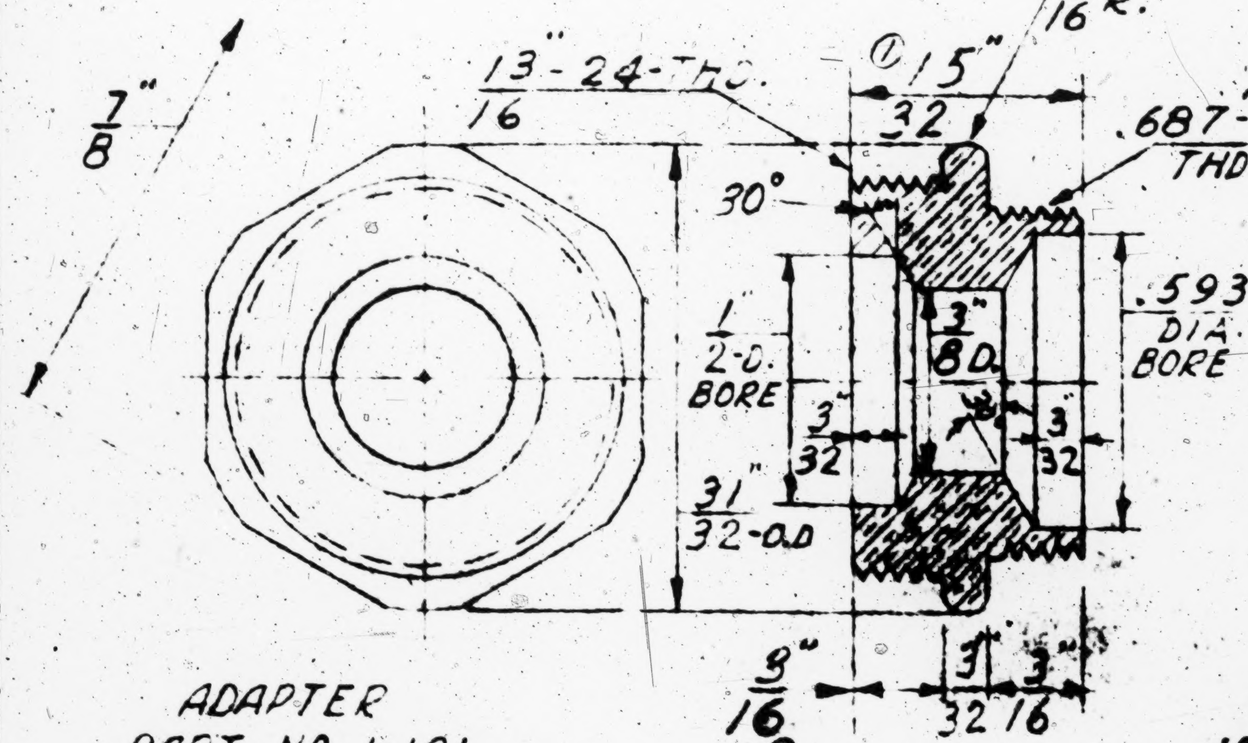
(See opposite ☞)







SCALE 2 TIMES SIZE

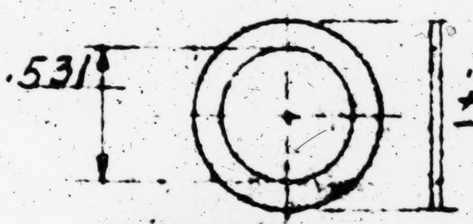


ADAPTER
PART Nº 1-121
MAT. 7/8" HEX. BR. ROD

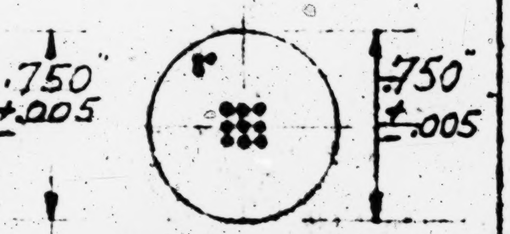
PART # 1-123

PART # 1-124

#28 STD. MESH BRASS SCREENS



GASKET
PART # 1-122
JOHNS MANSVILLE
SERVICE SHEET
1/32" THICK



PERFOR. DISC.
PART # 1-125
Nº 1 STRAIGHT-BORE
.027" DIA. HOLES
400 HOLES per SQ. IN.

THE CHICAGO FAUCET CO. CHECKED BY: H. STEEN DRG. Nº 1291

1-28-38 - H.A.T.
① RE-ISSUE 6-13-39 H.A.T. # 1-120
① RE-ISSUE 2-12-40 MAT # 1-121

Ex. 31

DRG. No. 1291

1291

6-26-50 Superseded Drawing

SOFTFLO BODY
PART Nº 1-120
MAT. ROD BRASS

7/8 O.D.

.593" BORE

15/16

.016

30°

17/64

30°

7/16

.250

FLO-CO IND.

3/8

.050

1/64

.822 C-BORE MARKED "115-8A"
1/32 DEEP

.687 BORE

1/8

1 1/4 DIA. SAW

1/8

13/16-24-TAP

SCALE 2 TIMES SIZE

1/16 R.

13/16-24-TAP

7/8

15/32

.687"-27 THD.

30°

.593" DIA. BORE

1/2 O. BORE

3/8 O.D.

3/32

3/32

31/32-O.D

9/16 O

3/32

3/16

ADAPTER
PART Nº 1-121
MAT. 7/8" HEX. BR. ROD

.609 ±.005

PART # 1-123

.687 ±.005

PART # 1-124

28 STD. MESH BRASS SCREENS

.531

.750 ±.005

GASKET
PART # 1-122
JOHNS MANSVILLE
SERVICE SHEET
1/32" THICK

.750 ±.005

PERFOR. DISC.
PART # 1-125
Nº 1 STRAIGHT-BRASS
.027" DIA. HOLES
400 HOLES per SQ. IN.

THE CHICAGO FAUCET CO. CHECKED BY: H. STEEN DRG. Nº 1291
1-28-38 - H.A.T.
① RE-ISSUE 6-13-39 H.A.T. # 1-120
① RE-ISSUE 2-12-40 MAT # 1-121

Defendant's Exhibit 31.

(See opposite ☞)

Defendant's Exhibit 32.

(See opposite ☞)

P. 195

Defendant's Exhibit 32

SOURCES OF SUPPLY	TERMS	F O B
+		—

SOURCES OF SUPPLY	TERMS	F O B
Johns-Manville Illinois Coal Spring Co.		

ON ORDER				RECEIPTS							RECEIPTS					
ORDER NUMBER	DATE	VENDOR	QUANTITY	VOUCHER	INVOICE DATE	VENDOR	QUANTITY	UNIT PRICE	INVOICE AMT.		VOUCHER	INVOICE DATE	VENDOR	QUANTITY	UNIT PRICE	INVOICE AMT.
1-177		JMCo	1000	300		1-125	10 20 38	Quadriga	1040	9.50 M	9.81		1-122	J.M.Co.	10M	2.95 M 29.50
1-176		ICSCo	1375	471.10		1-126	11 12 38	ICSCo.	2200		5.25		1-122	J.M.Co.	10M	" 29.50
8-123	8-15-38 Quadriga		1020	8.00 M	8.16		1-124	2-9-39	Quadriga	2100	6.00 M	12.60		1-125	Quadriga	10,900	5.25 M 57.23
1-124	"		1070	"	8.56		1-122	5-26-39	J.M.Co.	10M	2.95 M	29.50	10/9	1-124	"	10100	4.00 M 40.40
1-125			1020	9.50 M	9.69		1-124	5-31-39	Quadriga	10200	4.00 M	40.80	10/21	1-126	ICSCo	1100	2.40 M 2.64
1-122	J.M.Co.		2000	3.00 M	6.50		1-125	"	"	10300	5.25 M	54.08	10/25	"	"	9350	2.40 M 22.44
1-124	Quadriga		2200	6.00 M	13.29		1-126	6-21-39	ICSCo.	12500	2.40 M	30.00	10/31	1-122	J.M.Co.	20M	2.95 M 59.00
1-123	10-3-38 Quadriga		700	6.50 M	4.55		1-125	8-22-39	Quadriga	10M	5.00 M	52.50	11/2	1-125	Quadriga	10200	5.25 M 53.55
1-123	10-3-38 Quadriga		1400	6.50 M	9.10		1-124	"	"	10200	4.00 M	40.80	11/3	1-124	"	10600	4.00 M 42.40

1-177 #70 Service Wt 3400 x 17/32 (both +.003" or -.003") x 1/12" th K 1-103. 31/64" x 1" Smooth P.W.O.W. Wire Cloth Pieces Xind 11-1xd 11-1xd Smooth P.W.O.W. Wire Cloth Pieces Xind 11-1xd 11-1xd

Formed 1x31 1x31 (1-1xd 1-1xd)

(1-1xd 1-1xd diameters from Shop Log, Weight Variance Helen [illegible]

1-177 - H